Changes for the Better

MITSUBISHI ELECTRIC

SPLIT-TYPE, HEAT PUMP AIR CONDITIONERS

December 2012
No. OC307
REVISED EDITION-E

TECHNICAL & SERVICE MANUAL

Series PMFY Ceiling Cassettes R410A

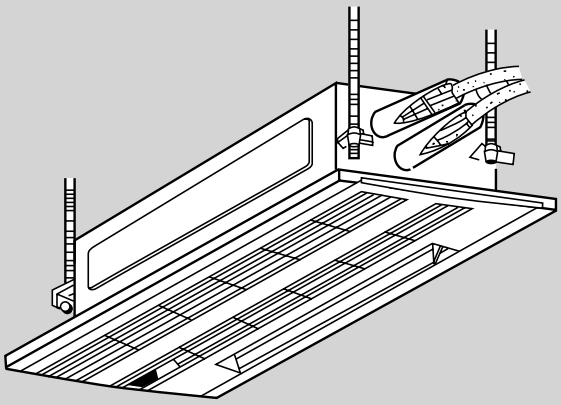
Indoor unit

[Model names]	[Service Ref.]	
PMFY-P20VBM-E	PMFY-P20VBM-E	PMFY-P20VBM-E$_1$
	PMFY-P20VBM-E#2	PMFY-P20VBM-ER3
	PMFY-P20VBM-ER4	
PMFY-P25VBM-E	PMFY-P25VBM-E	PMFY-P25VBM-E$_1$
	PMFY-P25VBM-E#2	PMFY-P25VBM-ER3
	PMFY-P25VBM-ER4	
PMFY-P32VBM-E	PMFY-P32VBM-E	PMFY-P32VBM-E$_1$
	PMFY-P32VBM-E#2	PMFY-P32VBM-ER3
	PMFY-P32VBM-ER4	
PMFY-P40VBM-E	PMFY-P40VBM-E	PMFY-P40VBM-E$_1$
	PMFY-P40VBM-E#2	PMFY-P40VBM-ER3
	PMFY-P40VBM-ER4	

Revision:
- PMFY-P20/25/32/40VBM-ER4 have been added in REVISED EDITION-E.
- Some descriptions have been modified.

- Please void OC307 REVISED EDITION-D.

Note:
- This manual describes only service data of the indoor units.
- RoHS compliant products have <G> mark on the spec name plate.
- For servicing RoHS compliant products, refer to the RoHS Parts List.



INDOOR UNIT

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1 TECHNICAL CHANGES

PMFY-P20VBM-ER3 → PMFY-P20VBM-ER4
PMFY-P25VBM-ER3 → PMFY-P25VBM-ER4
PMFY-P32VBM-ER3 → PMFY-P32VBM-ER4
PMFY-P40VBM-ER3 → PMFY-P40VBM-ER4

1. INDOOR CONTROLLER BOARD has been changed. (S/W version up)

PMFY-P20VBM-E#2 → PMFY-P20VBM-ER3
PMFY-P25VBM-E#2 → PMFY-P25VBM-ER3
PMFY-P32VBM-E#2 → PMFY-P32VBM-ER3
PMFY-P40VBM-E#2 → PMFY-P40VBM-ER3

1. DRAIN PIPE has been changed.
2. JOINT SOCKET (FOR DRAIN PIPE) has been added.

PMFY-P20VBM-E$_1$ → PMFY-P20VBM-E#2
PMFY-P25VBM-E$_1$ → PMFY-P25VBM-E#2
PMFY-P32VBM-E$_1$ → PMFY-P32VBM-E#2
PMFY-P40VBM-E$_1$ → PMFY-P40VBM-E#2

1. CONTROLLER BOARD (I.B) has been changed.
2. PANEL has been changed.
   PMP-40BM → PMP-40BMW
   (White : 0.98Y 8.99/0.63) (Pure white : 6.4Y 8.9/0.4)
3. FAN MOTOR (MF) has been changed.
4. THERMISTOR (TH22, TH23) have been changed.

PMFY-P20VBM-E → PMFY-P20VBM-E$_1$
PMFY-P25VBM-E → PMFY-P25VBM-E$_1$
PMFY-P32VBM-E → PMFY-P32VBM-E$_1$
PMFY-P40VBM-E → PMFY-P40VBM-E$_1$

1. FAN MOTOR (MF) has been changed.
2. CONTROLLER BOARD (I.B) has been changed.

2 SAFETY PRECAUTION

Cautions for units utilizing refrigerant R410A

Use new refrigerant pipes.

In case of using the existing pipes for R22, be careful with the followings.
· Change flare nut to the one provided with this product. Use a newly flared pipe.
· Avoid using thin pipes.

Make sure that the inside and outside of refrigerant piping is clean and it has no contaminants such as sulfur, oxides, dirt, shaving particles, etc, which are hazard to refrigerant cycle.
In addition, use pipes with specified thickness.

Contamination inside refrigerant piping can cause deterioration of refrigerant oil etc.

Store the piping indoors, and both ends of the piping sealed until just before brazing.
(Leave elbow joints, etc. in their packaging.)

If dirt, dust or moisture enters into refrigerant cycle, that can cause deterioration of refrigerant oil or malfunction of compressor.

The refrigerant oil applied to flare and flange connections must be ester oil, ether oil or alkylbenzene oil in a small amount.

If large amount of mineral oil enters, that can cause deterioration of refrigerant oil etc.

Charge refrigerant from liquid phase of gas cylinder.

If the refrigerant is charged from gas phase, composition change may occur in refrigerant and the efficiency will be lowered.

Do not use refrigerant other than R410A.

If other refrigerant (R22 etc.) is used, chlorine in refrigerant can cause deterioration of refrigerant oil etc.

Use a vacuum pump with a reverse flow check valve.

Vacuum pump oil may flow back into refrigerant cycle and that can cause deterioration of refrigerant oil etc.

Use the following tools specifically designed for use with R410A refrigerant.

The following tools are necessary to use R410A refrigerant.

Tools for R410A	
Gauge manifold	Flare tool
Charge hose	Size adjustment gauge
Gas leak detector	Vacuum pump adaptor
Torque wrench	Electronic refrigerant charging scale

Handle tools with care.

If dirt, dust or moisture enters into refrigerant cycle, that can cause deterioration of refrigerant oil or malfunction of compressor.

Do not use a charging cylinder.

If a charging cylinder is used, the composition of refrigerant will change and the efficiency will be lowered.

Use the specified refrigerant only.

Never use any refrigerant other than that specified.
Doing so may cause a burst, an explosion, or fire when the unit is being used, serviced, or disposed of.
Correct refrigerant is specified in the manuals and on the spec labels provided with our products.
We will not be held responsible for mechanical failure, system malfunction, unit breakdown or accidents caused by failure to follow the instructions.

Ventilate the room if refrigerant leaks during operation. If refrigerant comes into contact with a flame, poisonous gases will be released.

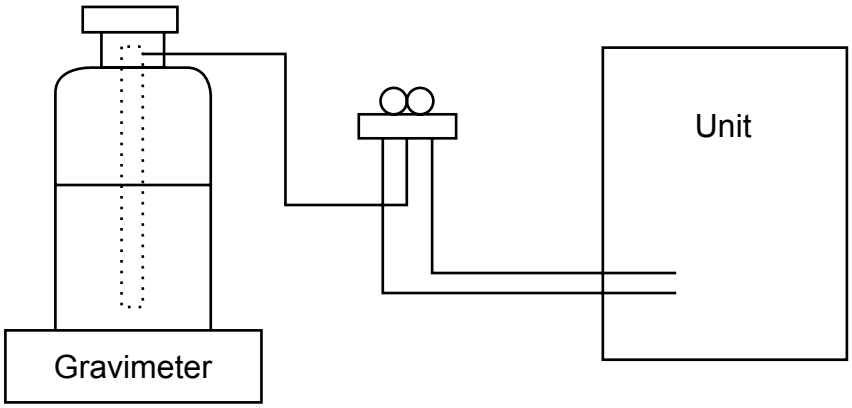
[1] Cautions for service

(1) Perform service after recovering the refrigerant left in unit completely.
(2) Do not release refrigerant in the air.
(3) After completing service, charge the cycle with specified amount of refrigerant.
(4) When performing service, install a filter drier simultaneously.
Be sure to use a filter drier for new refrigerant.

[2] Additional refrigerant charge

When charging directly from cylinder

· Check that cylinder for R410A on the market is syphon type.
· Charging should be performed with the cylinder of syphon stood vertically. (Refrigerant is charged from liquid phase.)



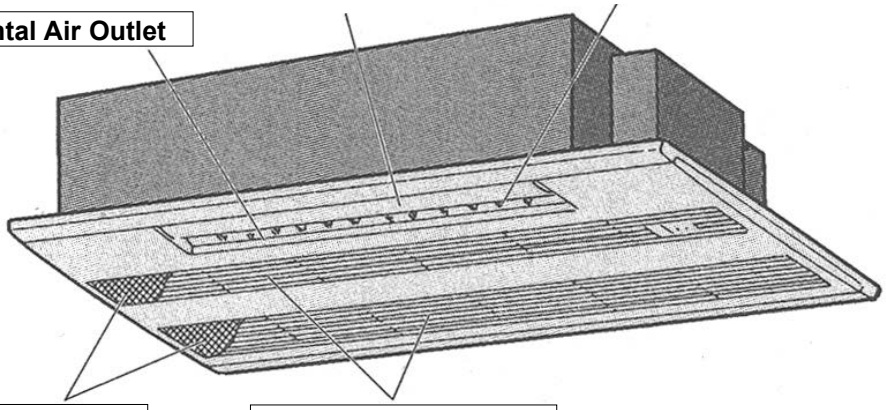
[3] Service tools

Use the below service tools as exclusive tools for R410A refrigerant.

No.	Tool name	Specifications
①	Gauge manifold	· Only for R410A
		· Use the existing fitting specifications. (UNF1/2)
		· Use high-tension side pressure of 5.3MPa·G or over.
②	Charge hose	· Only for R410A
		· Use pressure performance of 5.09MPa·G or over.
③	Electronic scale	—
④	Gas leak detector	· Use the detector for R134a, R407C or R410A.
⑤	Adapter for reverse flow check	· Attach on vacuum pump.
⑥	Refrigerant charge base	—
⑦	Refrigerant cylinder	· Only for R410A · Top of cylinder (Pink) · Cylinder with syphon
⑧	Refrigerant recovery equipment	—

3 PART NAMES AND FUNCTIONS

3-1. Indoor Unit


Auto Air Swing Vane
Disperses airflow up and down and adjusts the angle of airflow direction.
Guide vane
Air flow can be changed to horizontal by moving the Guide vane to the left or right.
Horizontal Air Outlet
Filters
Remove dust and pollutants from return air.
Air intake
Returns air from room.

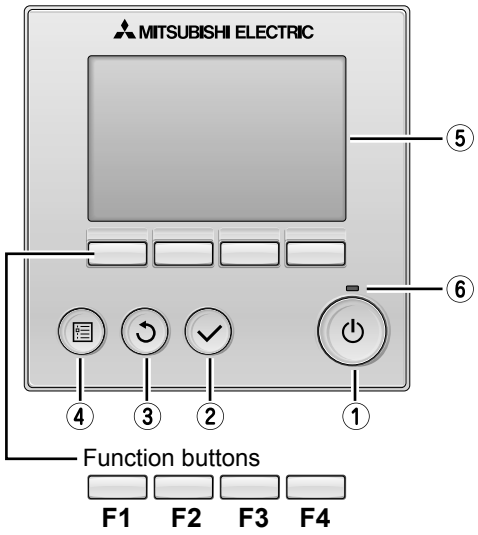
3-2. WIRED REMOTE CONTROLLER <PAR-30MAA/PAR-31MAA>

Wired remote controller function

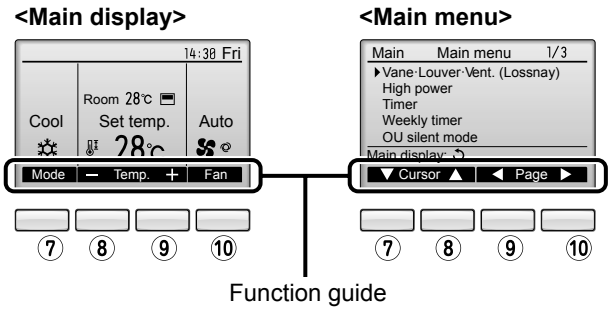
* The functions which can be used are restricted according to the model.

○ : Supported × : Unsupported

	Function	PAR-30MAA/PAR-31MAA		PAR-21MAA
		Slim	City multi	
Body	Product size H × W × D (mm)	120 × 120 × 19		120 × 130 × 19
	LCD	Full Dot LCD		Partial Dot LCD
	Backlight	○		×
Energy-saving	Energy-saving operation schedule	○	×	×
	Automatic return to the preset temperature	○		×
Restriction	Setting the temperature range restriction	○		○
Function	Operation lock function	○		○
	Weekly timer	○		×
	On / Off timer	○		○
	High Power	○	×	×
	Manual vane angle	○		○



The functions of the function buttons change depending on the screen. Refer to the button function guide that appears at the bottom of the LCD for the functions they serve on a given screen.
When the system is centrally controlled, the button function guide that corresponds to the locked button will not appear.



① ON / OFF button

Press to turn ON/OFF the indoor unit.

② SELECT button

Press to save the setting.

③ RETURN button

Press to return to the previous screen.

④ MENU button

Press to bring up the Main menu.

⑤ Backlit LCD

Operation settings will appear.
When the backlight is off, pressing any button turns the backlight on and it will stay lit for a certain period of time depending on the screen.

When the backlight is off, pressing any button turns the backlight on and does not perform its function. (except for the ⏻ (ON / OFF) button)

⑥ ON / OFF lamp

This lamp lights up in green while the unit is in operation. It blinks while the remote controller is starting up or when there is an error.

⑦ Function button F1

Main display : Press to change the operation mode.
Main menu : Press to move the cursor down.

⑧ Function button F2

Main display : Press to decrease temperature.
Main menu : Press to move the cursor up.

⑨ Function button F3

Main display : Press to increase temperature.
Main menu : Press to go to the previous page.

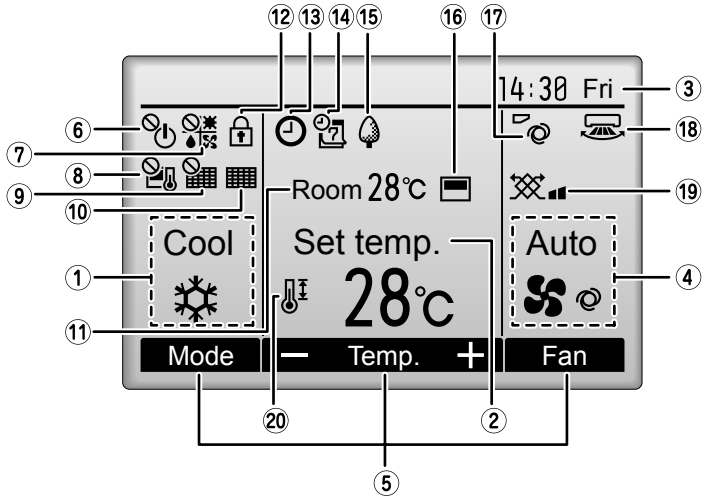
⑩ Function button F4

Main display : Press to change the fan speed.
Main menu : Press to go to the next page.

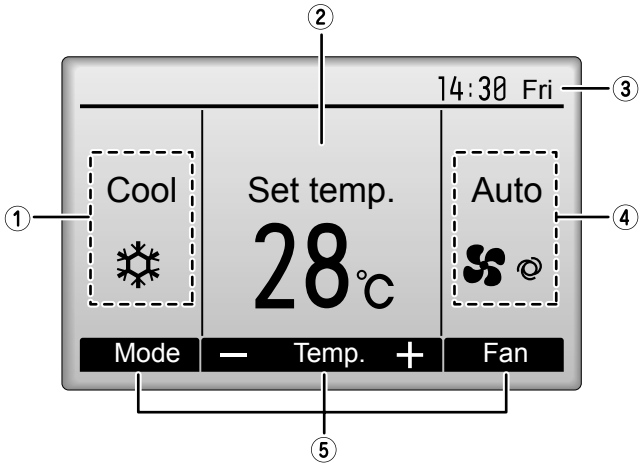
The main display can be displayed in two different modes: "Full" and "Basic".
The factory setting is "Full". To switch to the "Basic" mode, change the setting on the Main display setting.

<Full mode>

* All icons are displayed for explanation.



<Basic mode>



① Operation mode

Indoor unit operation mode appears here.

② Preset temperature

Preset temperature appears here.

③ Clock (See the Installation Manual.)

Current time appears here.

④ Fan speed

Fan speed setting appears here.

⑤ Button function guide

Functions of the corresponding buttons appear here.

⑥

Appears when the ON/OFF operation is centrally controlled.

⑦

Appears when the operation mode is centrally controlled.

⑧

Appears when the preset temperature is centrally controlled.

⑨

Appears when the f lter reset function is centrally controlled.

⑩

Indicates when f lter needs maintenance.

⑪ Room temperature (See the Installation Manual.)

Current room temperature appears here.

⑫

Appears when the buttons are locked.

⑬

Appears when the On/Off timer or Night setback function is enabled.

⑭

Appears when the Weekly timer is enabled.

⑮

Appears while the units are operated in the energy-save mode.

⑯

Appears when the built-in thermistor on the remote controller is activated to monitor the room temperature.
appears when the thermistor on the indoor unit is activated to monitor the room temperature.

⑰

Indicates the vane setting.

⑱

Indicates the louver setting.

⑲

Indicates the ventilation setting.

⑳

Appears when the preset temperature range is restricted.

Most settings (except ON / OFF, mode, fan speed, temperature) can be made from the Menu screen.

Menu structure

Not all functions are available on all models of indoor units.

Main menu list

Setting and display items		Setting details
Vane · Louver · Vent. (Lossnay)		**Use to set the vane angle.** • Select a desired vane setting from f ve different settings. **Use to turn ON / OFF the louver.** • Select a desired setting from "ON" and "OFF." **Use to set the amount of ventilation.** • Select a desired setting from "Off," "Low," and "High."
High power		**Use to reach the comfortable room temperature quickly.** • Units can be operated in the High-power mode for up to 30 minutes.
Timer	**On/Off timer**	**Use to set the operation On/Off times.** • Time can be set in 5-minute increments. * Clock setting is required.
	Auto-Off timer	**Use to set the Auto-Off time.** • Time can be set to a value from 30 to 240 in 10-minute increments.
Filter information		**Use to check the f lter status.** • The f lter sign can be reset.
Error information		**Use to check error information when an error occurs.** • Error code, error source, refrigerant address, unit model, manufacturing number, contact information (dealer's phone number) can be displayed. * The unit model, manufacturing number, and contact information need to be registered in advance to be displayed.
Weekly timer		**Use to set the weekly operation On / Off times.** • Up to eight operation patterns can be set for each day. * Clock setting is required. * Not valid when the On/Off timer is enabled.
Energy saving	**Auto return**	**Use to get the units to operate at the preset temperature after performing energy-save operation for a specif ed time period.** • Time can be set to a value from 30 and 120 in 10-minute increments. * This function will not be valid when the preset temperature ranges are restricted.
	Schedule	**Set the start/stop times to operate the units in the energy-save mode for each day of the week, and set the energy-saving rate.** • Up to four energy-save operation patterns can be set for each day. • Time can be set in 5-minute increments. • Energy-saving rate can be set to a value from 0% or 50 to 90% in 10% increments. * Clock setting is required.
Night setback		**Use to make Night setback settings.** • Select "Yes" to enable the setting, and "No" to disable the setting. The temperature range and the start/stop times can be set. * Clock setting is required.
Restriction	**Temp. range**	**Use to restrict the preset temperature range.** • Different temperature ranges can be set for different operation modes.
	Operation lock	**Use to lock selected functions.** • The locked functions cannot be operated.
Maintenance	**Auto descending panel**	**Auto descending panel (Optional parts) Up / Down you can do.**
	Manual vane angle	**Use to set the vane angle for each vane to a f xed position.**
Initial setting	**Main/Sub**	**When connecting two remote controllers, one of them needs to be designated as a sub controller.**
	Clock	**Use to set the current time.**
	Main display	**Use to switch between "Full" and "Basic" modes for the Main display.** • The default setting is "Full."
	Contrast	**Use to adjust screen contrast.**

Setting and display items		Setting details
Initial setting	**Display details**	**Make the settings for the remote controller related items as necessary.** **Clock:** The factory settings are "Yes" and "24h" format. **Temperature:** Set either Celsius (°C) or Fahrenheit (°F). **Room temp. :** Set Show or Hide. **Auto mode:** Set the Auto mode display or Only Auto display.
	Auto mode	**Whether or not to use the AUTO mode can be selected by using the button.** **This setting is valid only when indoor units with the AUTO mode function are connected.**
	Administrator password	**The administrator password is required to make the settings for the following items.** • Timer setting • Energy-save setting • Weekly timer setting • Restriction setting • Outdoor unit silent mode setting • Night set back
	Language selection	**Use to select the desired language.**
Service	**Test run**	**Select "Test run" from the Service menu to bring up the Test run menu.** • Test run • Drain pump test run
	Input maintenance	**Select "Input maintenance Info." from the Service menu to bring up the Maintenance information screen.** **The following settings can be made from the Maintenance Information screen.** • Model name input • Serial No. input • Dealer information input
	Function setting	**Make the settings for the indoor unit functions via the remote controller as necessary.**
	LOSSNAY setting (City Multi only)	**This setting is required only when the operation of City Multi units is interlocked with LOSSNAY units.**
	Check	**Error history:** Display the error history and execute delete error history. **Refrigerant leak check:** Refrigerant leaks can be judged. **Smooth maintenance:** The indoor and outdoor maintenance data can be displayed. **Request cord:** Details of the operation data including each thermistor temperature and error history can be checked.
	Self check	**Error history of each unit can be checked via the remote controller.**
	Maintenance password	**Take the following steps to change the maintenance password.**
	Remote controller check	**When the remote controller does not work properly, use the remote controller checking function to troublushoot the problem.**

3-3. WIRED REMOTE CONTROLLER <PAR-21MAA>

Display Section

For purposes of this explanation, all parts of the display are shown. During actual operation, only the relevant items will be lit.

Day-of-Week
Shows the current day of the week.

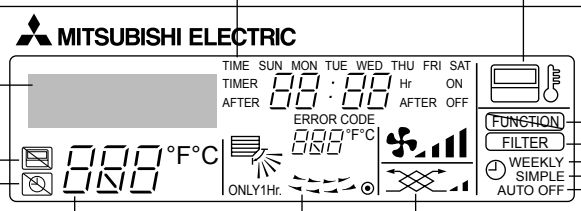
Time/Timer Display
Shows the current time, unless the simple or Auto Off timer is set.
If the simple or Auto Off timer is set, the time to be switched off is shown.

"Sensor" indication
Displayed when the remote controller sensor is used.

"Locked" indicator
Indicates that remote controller buttons have been locked.

"Clean The Filter" indicator
To be displayed on when it is time to clean the filter.

Identifies the current operation
Shows the operating mode, etc.
*Multilanguage display is available.



Timer indicators
The indicator comes on if the corresponding timer is set.

"Centrally Controlled" indicator
Indicates that operation from the remote controller has been prohibited by a master controller.

Fan Speed indicator
Shows the selected fan speed.

Ventilation indicator
Appears when the unit is running in Ventilation mode.

"Timer is Off" indicator
Indicates that the timer is off.

Up/Down Air Direction indicator
The indicator ↘ shows the direction of the outcoming airflow.

Room Temperature display
Shows the room temperature. The room temperature display range is 8 - 39℃. The display blinks if the temperature is less than 8℃ or 39℃ or more.

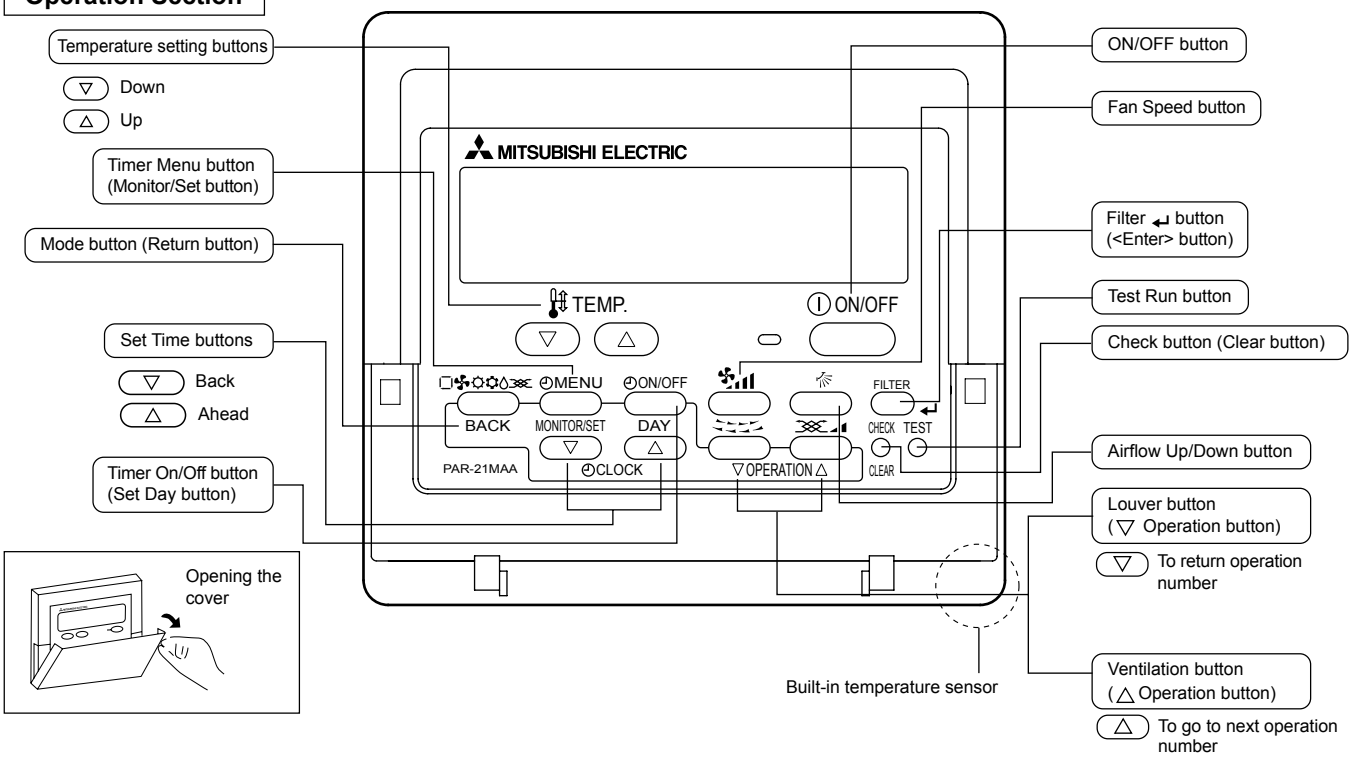
"One Hour Only" indicator
Displayed if the airflow is set to Low or downward during COOL or DRY mode. (Operation varies according to model.)
The indicator goes off in one hour, at which time the airflow direction also changes.

Louver display
Indicates the action of the swing louver. Does not appear if the louver is not running.

Temperature Setting
Shows the target temperature.

◉ (Power On indicator)
Indicates that the power is on.

Operation Section



Note:
- "PLEASE WAIT" message
  This message is displayed for approximately 3 minutes when power is supplied to the indoor unit or when the unit is recovering from a power failure.
- "NOT AVAILABLE" message
  This message is displayed if an invalid button is pressed (to operate a function that the indoor unit does not have).
  If a single remote controller is used to operate multiple indoor units simultaneously that are different types, this message will not be displayed as far as any of the indoor units is equipped with the function.

4 SPECIFICATIONS

4-1. SPECIFICATION

Item				PMFY-P20VBM-E PMFY-P20VBM-E$_1$ PMFY-P20VBM-E#2 PMFY-P20VBM-ER3 PMFY-P20VBM-ER4	PMFY-P25VBM-E PMFY-P25VBM-E$_1$ PMFY-P25VBM-E#2 PMFY-P25VBM-ER3 PMFY-P25VBM-ER4	PMFY-P32VBM-E PMFY-P32VBM-E$_1$ PMFY-P32VBM-E#2 PMFY-P32VBM-ER3 PMFY-P32VBM-ER4	PMFY-P40VBM-E PMFY-P40VBM-E$_1$ PMFY-P40VBM-E#2 PMFY-P40VBM-ER3 PMFY-P40VBM-ER4
Power			V･Hz	Single phase 220V-230V-240V 50Hz / 220V 60Hz			
Cooling capacity			kW	2.2	2.8	3.6	4.5
Heating capacity			kW	2.5	3.2	4.0	5.0
Electric characteristic	Input	Cooling	kW	0.042	0.044	0.044	0.054
		Heating	kW	0.042	0.044	0.044	0.054
	Current	Cooling	A	0.20	0.21	0.21	0.26
		Heating	A	0.20	0.21	0.21	0.26
Exterior (munsell symbol)			—	Unit : Galvanized sheets · Standard grilles : ABS resin acrylic coating Munsell <0.98Y 8.99/0.63> (PMFY-P·VBM-E$_{(1)}$) / <6.4Y 8.9/0.4> (PMFY-P·VBM-E#2/ER3/ER4)			
Dimensions		Height	mm	230<30>			
		Width	mm	812<1,000>			
		Depth	mm	395<470>			
Heat exchanger			—	Cross fin			
Fan	Fan × No		—	Line flow fan × 1			
	Air flow *3		m^3/min	8.7 - 8.0 - 7.2 - 6.5	9.3 - 8.6 - 8.0 - 7.3		10.7 - 9.7 - 8.7 - 7.7
	External static pressure		Pa	0			
	Fan motor output		kW	0.028			
Insulator			—	Polyethylene sheet			
Air filter			—	PP honey comb fabric			
Pipe dimensions		Gas side	ϕmm(in.)	12.7(1/2")			
		Liquid side	ϕmm(in.)	6.35(1/4")			
Field drain pipe size			ϕmm	O.D.26 (PVC pipe VP-20 connectable)			
Noise level *3			dB	35 - 33 - 30 - 27	37 - 36 - 34 - 32		39 - 37 - 35 - 33
Product weight			kg	14<3.0>			

Note 1. Rating conditions (JIS B 8615-1)
Cooling: Indoor: D.B. 27°C W.B. 19°C
outdoor: D.B. 35°C
Heating: Indoor: D.B. 20°C
outdoor: D.B. 7°C W.B. 6°C

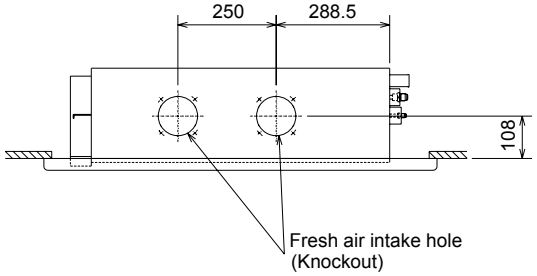
Note 2. The number indicated in < > is for the grille.
*3. Air flow and the noise level are indicated as High – Medium1 – Medium2 – Low.

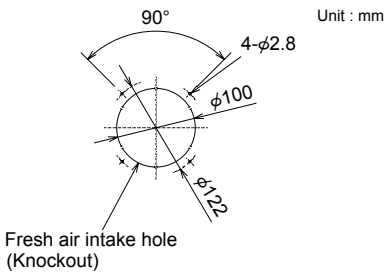
4-2. ELECTRIC PARTS SPECIFICATIONS

Service ref. / Parts name	Symbol	PMFY-P20VBM-E PMFY-P20VBM-E$_1$ PMFY-P20VBM-E#2 PMFY-P20VBM-ER3 PMFY-P20VBM-ER4	PMFY-P25VBM-E PMFY-P25VBM-E$_1$ PMFY-P25VBM-E#2 PMFY-P25VBM-ER3 PMFY-P25VBM-ER4	PMFY-P32VBM-E PMFY-P32VBM-E$_1$ PMFY-P32VBM-E#2 PMFY-P32VBM-ER3 PMFY-P32VBM-ER4	PMFY-P40VBM-E PMFY-P40VBM-E$_1$ PMFY-P40VBM-E#2 PMFY-P40VBM-ER3 PMFY-P40VBM-ER4
Room temperature thermistor	TH21	Resistance 0℃/15kΩ, 10℃/9.6kΩ, 20℃/6.3kΩ, 25℃/5.4kΩ, 30℃/4.3kΩ, 40℃/3.0kΩ			
Liquid pipe thermistor	TH22	Resistance 0℃/15kΩ, 10℃/9.6kΩ, 20℃/6.3kΩ, 25℃/5.4kΩ, 30℃/4.3kΩ, 40℃/3.0kΩ			
Gas pipe thermistor	TH23	Resistance 0℃/15kΩ, 10℃/9.6kΩ, 20℃/6.3kΩ, 25℃/5.4kΩ, 30℃/4.3kΩ, 40℃/3.0kΩ			
Fuse (Indoor controller board)	FUSE	250V 6.3A			
Fan motor	MF	DC Brushless Motor 8-pole OUTPUT 28W PN0H28-MB			
Vane motor	MV	MSFJC 20M23 12V/380Ω			
Drain pump	DP	PJV-1046 220-240V 50/60Hz			
Drain sensor	DS	Thermistor resistance 0℃/6kΩ, 10℃/3.9kΩ, 20℃/2.6kΩ, 25℃/2.2kΩ, 30℃/1.8kΩ, 40℃/1.3kΩ			
Linear expansion valve	LEV	DC12V Stepping motor drive, Port dimension ϕ3.2 (0~2000pulse)			
Power supply terminal block	TB2	(L, N, ⏚) 330V 30A			
Transmission terminal block	TB5	(M1, M2, S) 250V 20A			
MA-remote controller terminal block	TB15	(1,2) 250V 10A			

4-3. AIR CAPACITY TAKEN FROM OUTSIDE

PMFY-P·VBM-E series enables to take fresh air from outside. When taking fresh air, the duct fan is used. The air capacity should be 20% or less of the air flow SPEC(Hi).

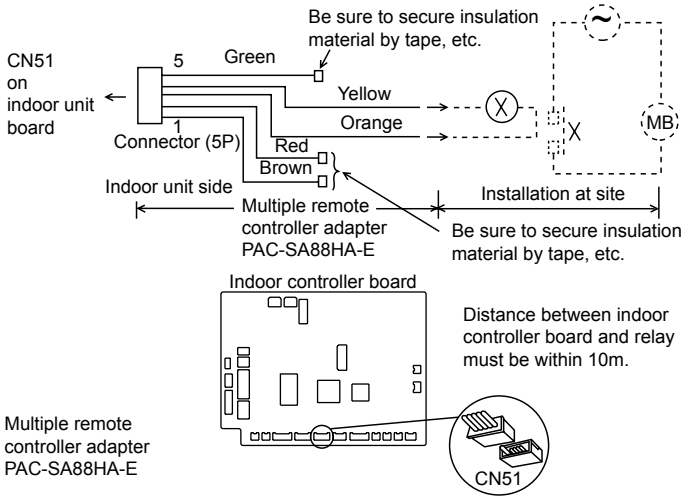




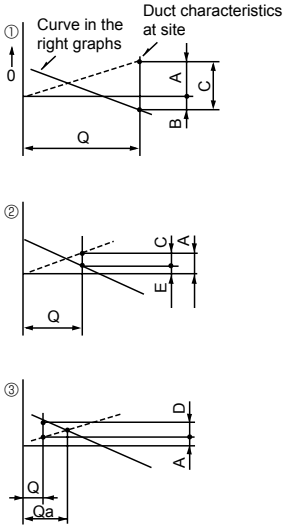
Service Ref.		Air flow (Hi)	Air capacity from outside
PMFY-P20VBM-E PMFY-P20VBM-E1 PMFY-P20VBM-E#2	PMFY-P20VBM-ER3 PMFY-P20VBM-ER4	8.7m³/min	Max 1.74m³/min
PMFY-P25VBM-E PMFY-P25VBM-E1 PMFY-P25VBM-E#2	PMFY-P25VBM-ER3 PMFY-P25VBM-ER4	9.3m³/min	Max 1.86m³/min
PMFY-P32VBM-E PMFY-P32VBM-E1 PMFY-P32VBM-E#2	PMFY-P32VBM-ER3 PMFY-P32VBM-ER4	9.3m³/min	Max 1.86m³/min
PMFY-P40VBM-E PMFY-P40VBM-E1 PMFY-P40VBM-E#2	PMFY-P40VBM-ER3 PMFY-P40VBM-ER4	10.7m³/min	Max 2.14m³/min

Operation in conjunction with duct fan (Booster fan)

- Whenever the indoor unit is operating, the duct fun operates.
  (1) Connect the optional multiple remote controller adapter (PAC-SA88HA-E) to the connector CN51 on the indoor controller board.
  (2) Drive the relay after connecting the 12V DC relay between the Yellow and Orange connector lines.
  (*) Use a relay of 1W or smaller.
  MB: Electromagnetic switch power relay for duct fan.
  X: Auxiliary relay (12V DC LY-1F)

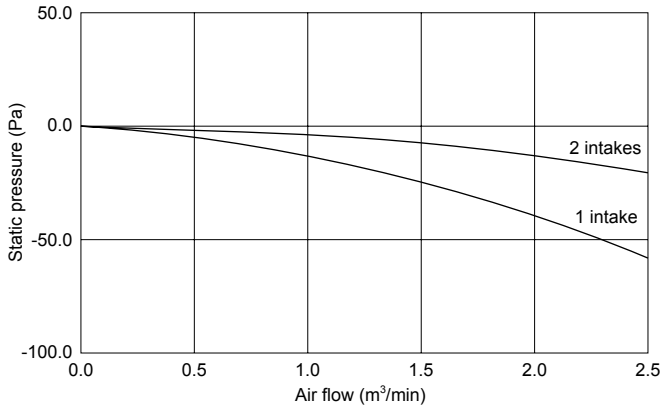


How to read curves



Q…Designed amount of fresh air intake <m³/min>
A…Static pressure loss of fresh air intake duct system with air flow amount Q <Pa>
B…Forced static pressure at air conditioner inlet with air flow amount Q <Pa>
C…Static pressure of booster fan with air flow amount Q <Pa>
D…Static pressure loss increase amount of fresh air intake duct system for air flow amount Q <Pa>
E…Static pressure of indoor unit with air flow amount Q <Pa>
Qa…Estimated amount of fresh air intake without D <m³/min>

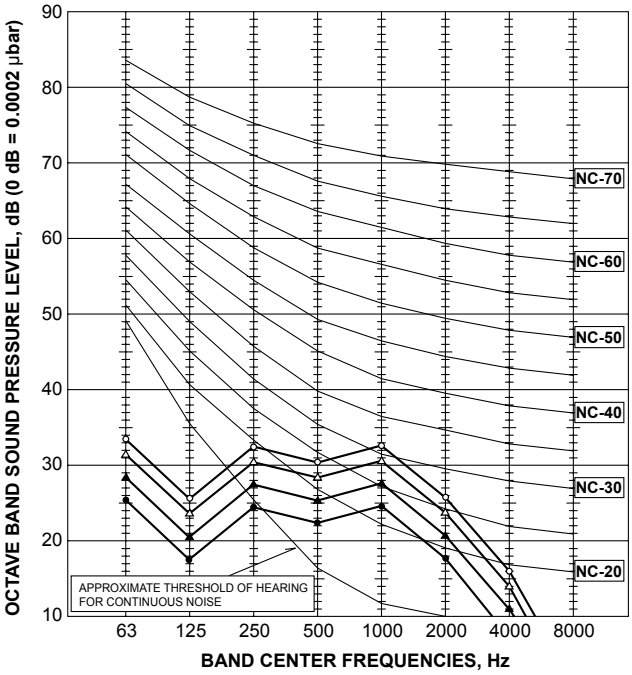
Characteristic diagram of fresh air taken capacity



4-4. NOISE CRITERION CURVES

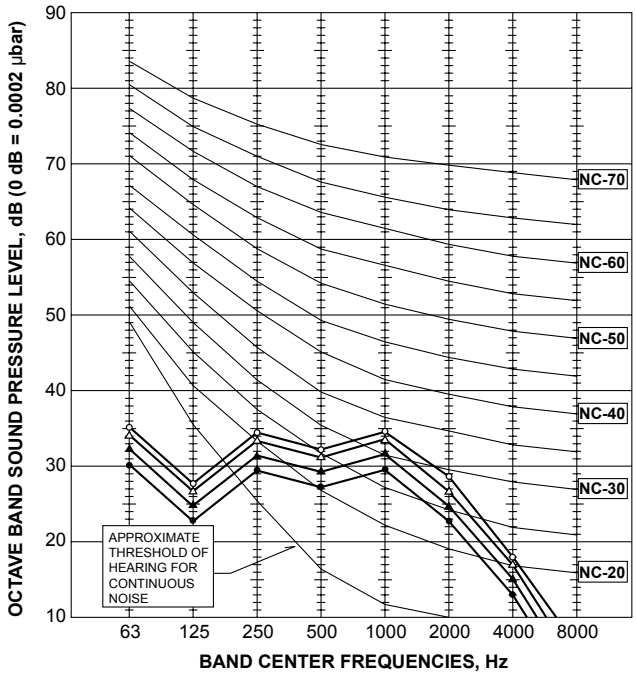
PMFY-P20VBM-E
PMFY-P20VBM-E$_1$
PMFY-P20VBM-E#2
PMFY-P20VBM-ER3
PMFY-P20VBM-ER4

NOTCH	SPL(dB)	LINE
High	35	
Medium1	33	
Medium2	30	
Low	27	



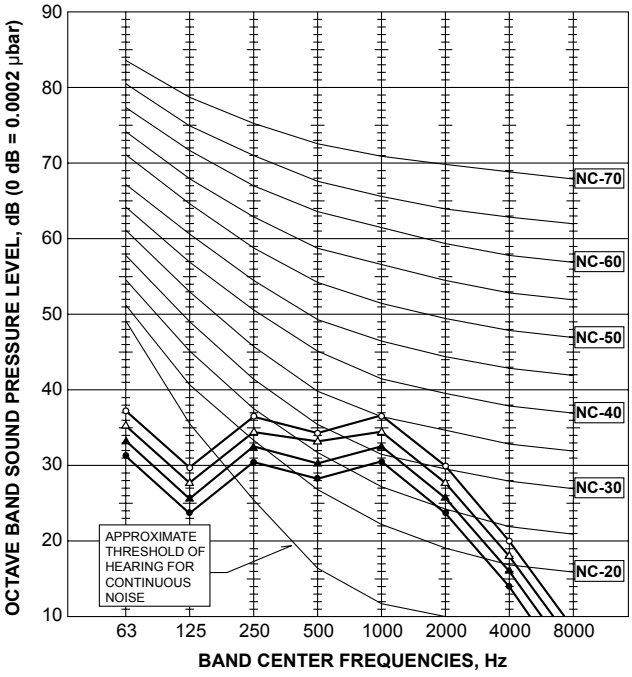
PMFY-P25/32VBM-E
PMFY-P25/32VBM-E$_1$
PMFY-P25/32VBM-E#2
PMFY-P25/32VBM-ER3
PMFY-P25/32VBM-ER4

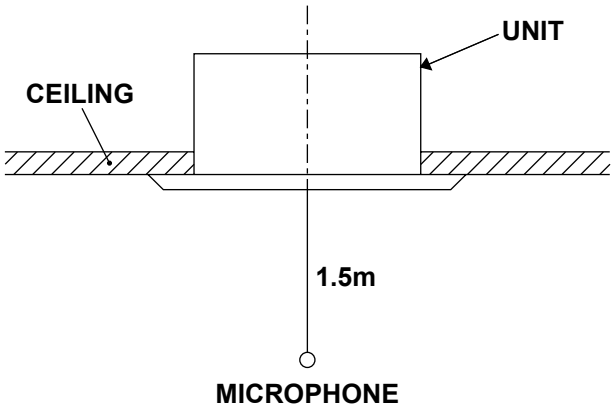
NOTCH	SPL(dB)	LINE
High	37	
Medium1	36	
Medium2	34	
Low	32	



PMFY-P40VBM-E
PMFY-P40VBM-E$_1$
PMFY-P40VBM-E#2
PMFY-P40VBM-ER3
PMFY-P40VBM-ER4

NOTCH	SPL(dB)	LINE
High	39	
Medium1	37	
Medium2	35	
Low	33	





5 OUTLINES AND DIMENSIONS

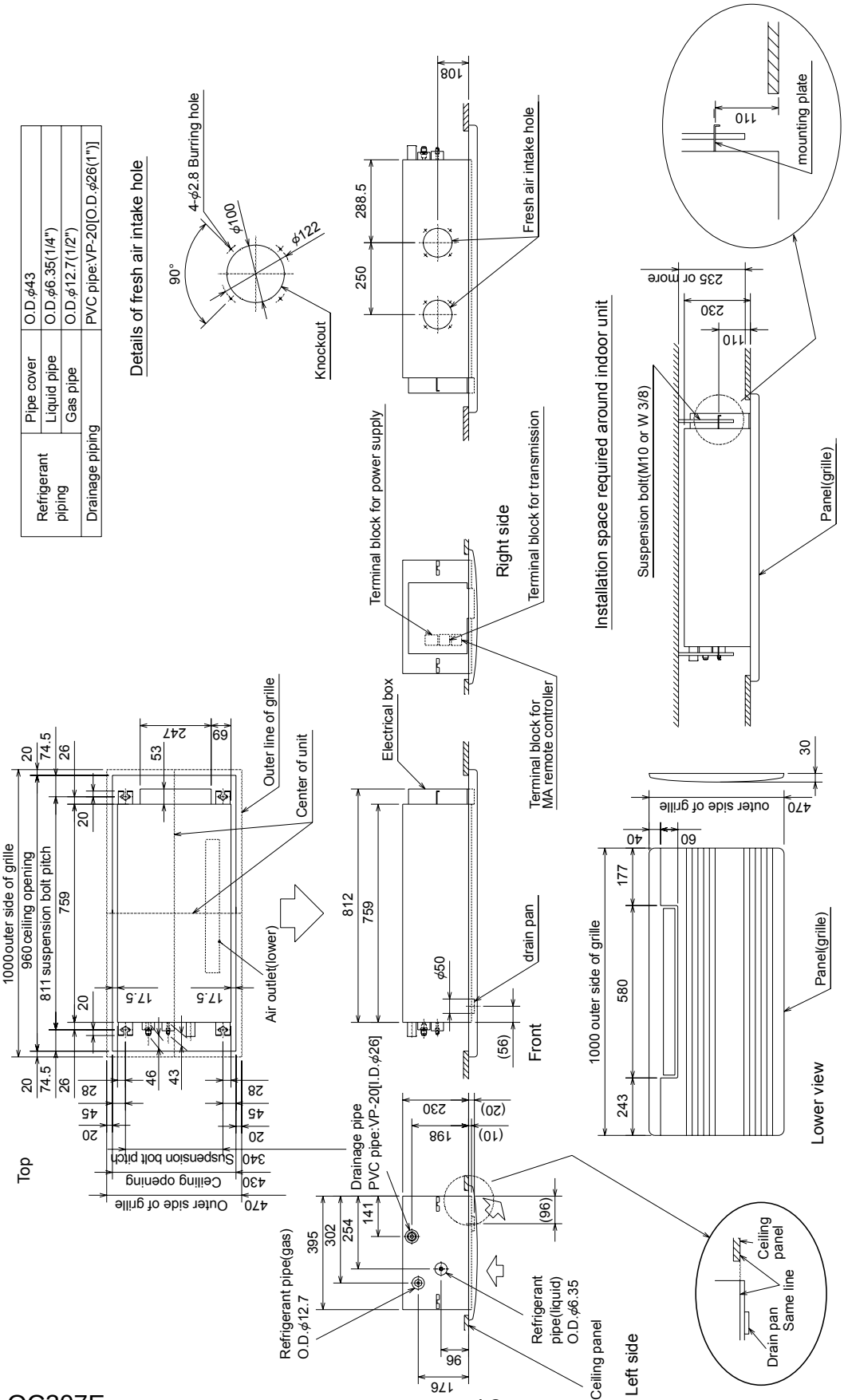
PMFY-P20VBM-E
PMFY-P20VBM-E$_1$
PMFY-P20VBM-E#2
PMFY-P20VBM-ER3
PMFY-P20VBM-ER4

PMFY-P25VBM-E
PMFY-P25VBM-E$_1$
PMFY-P25VBM-E#2
PMFY-P25VBM-ER3
PMFY-P25VBM-ER4

PMFY-P32VBM-E
PMFY-P32VBM-E$_1$
PMFY-P32VBM-E#2
PMFY-P32VBM-ER3
PMFY-P32VBM-ER4

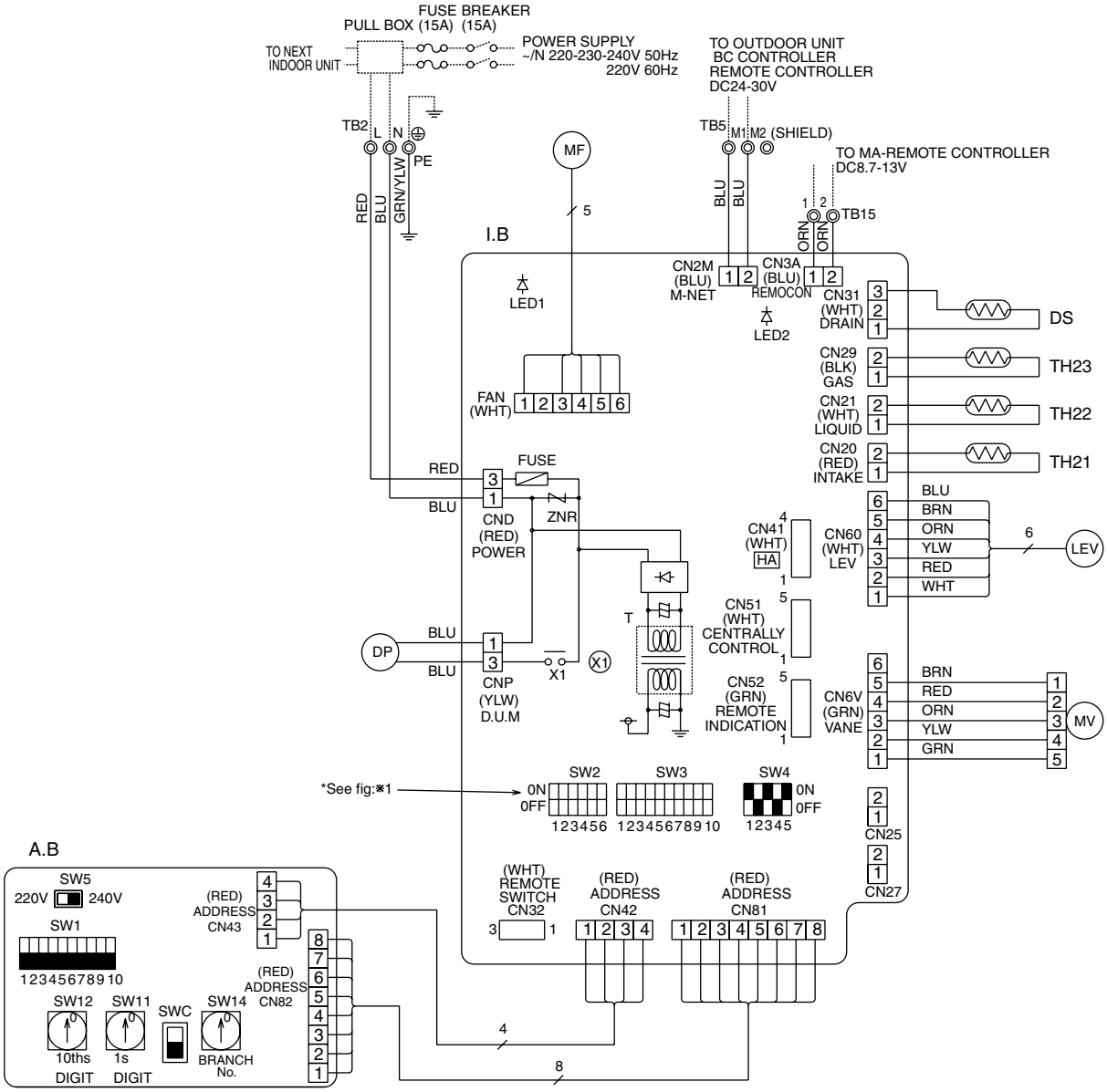
PMFY-P40VBM-E
PMFY-P40VBM-E$_1$
PMFY-P40VBM-E#2
PMFY-P40VBM-ER3
PMFY-P40VBM-ER4

Unit : mm



6 WIRING DIAGRAM

PMFY-P20VBM-E PMFY-P25VBM-E PMFY-P32VBM-E PMFY-P40VBM-E



[LEGEND]

SYMBOL		NAME		SYMBOL	NAME	
I.B		INDOOR CONTROLLER BOARD		MF	FAN MOTOR	
	CN25	CONNECTOR	HUMIDIFIER	MV	VANE MOTOR	
	CN27		DAMPER	DP	DRAIN PUMP	
	CN32		REMOTE SWITCH	DS	DRAIN SENSOR	
	CN41		HA TERMINAL-A	TB2	TERMINAL BLOCK	POWER SUPPLY
	CN51		CENTRALLY CONTROL	TB5		TRANSMISSION
	CN52		REMOTE INDICATION	TB15		MA-REMOTE CONTROLLER
	SW2	SWITCH	CAPACITY CODE	TH21	THERMISTOR	ROOM TEMPERATURE DETECTION (0℃/15kΩ, 25℃/5.4kΩ)
	SW3		MODE SELECTION			
	SW4		MODEL SELECTION	TH22		PIPE TEMPERATURE DETECTION/LIQUID (0℃/15kΩ, 25℃/5.4kΩ)
	ZNR	VARISTOR		TH23		PIPE TEMPERATURE DETECTION/GAS (0℃/15kΩ, 25℃/5.4kΩ)
	FUSE	FUSE(6.3A/250V)		LEV	LINEAR EXPANSION VALVE	
	X1	AUX.RELAY	DRAIN PUMP			
	T	TRANSFORMER				
	LED1	POWER SUPPLY(I.B)				
	LED2	POWER SUPPLY(I.B)				
A.B		CIRCUIT BOARD				
	SW1	SWITCH	MODE SELECTION			
	SW5		VOLTAGE SELECTION			
	SW11		ADDRESS SETTING 1s DIGIT			
	SW12		ADDRESS SETTING 10ths DIGIT			
	SW14		BRANCH NO.			

<※1>

MODELS	SW2	SW3
P20VBM	0N 0FF 123456	0N 0FF 12345678910
P25VBM	0N 0FF 123456	0N 0FF 12345678910
P32VBM	0N 0FF 123456	0N 0FF 12345678910
P40VBM	0N 0FF 123456	0N 0FF 12345678910

The black square (■) indicates a switch position.

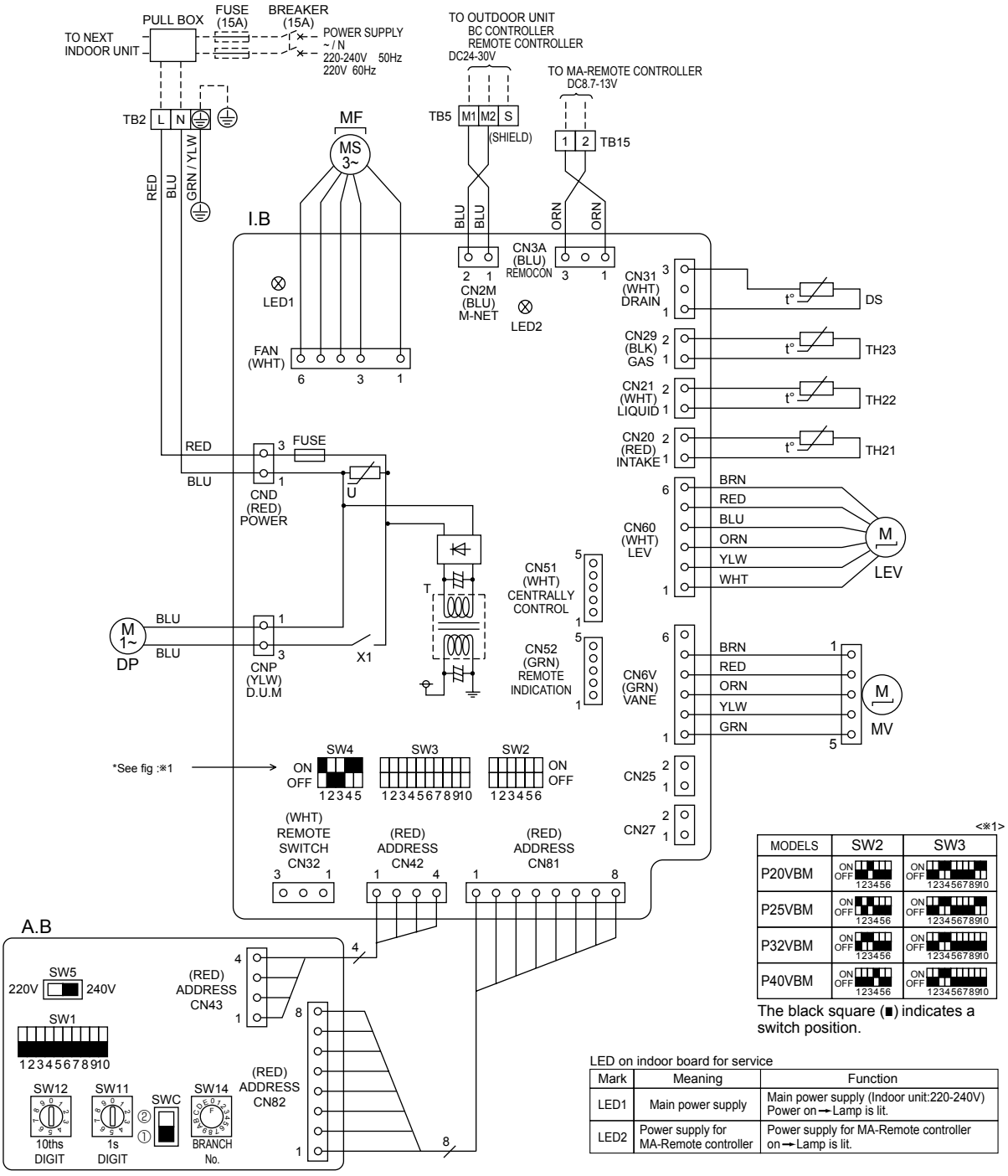
LED on indoor board for service

Mark	Meaning	Function
LED1	Main power supply	Main power supply(Indoor unit:220-240V) power on → Lamp is lit.
LED2	Power supply for MA-Remote controller	Power supply for MA-Remote controller on → Lamp is lit.

NOTES:

1. At servicing for outdoor unit, always follow the wiring diagram of outdoor unit.
2. In case of using MA-Remote controller, please connect to TB15. (Remote controller wire is non-polar.)
3. In case of using M-NET, please connect to TB5.(Transmission wire is non-polar.)
4. Symbol [S] of TB5 is the shield wire connection.
5. Symbols used in wiring diagram above are, ◎ : terminal block, □□□: connector.
6. The setting of the SW2 dip switches differs in the capacity. For the detail, refer to the table above.
7. Please set the switch SW5 according to the power supply voltage. Set SW5 to 240V side when the power supply is 230 and 240 volts. When the power supply is 220 volts, set SW5 to 220V side.

PMFY-P20VBM-E1 PMFY-P25VBM-E1 PMFY-P32VBM-E1 PMFY-P40VBM-E1



<※1>

MODELS	SW2	SW3
P20VBM	ON OFF 123456	ON OFF 1234567891 0
P25VBM	ON OFF 123456	ON OFF 1234567891 0
P32VBM	ON OFF 123456	ON OFF 1234567891 0
P40VBM	ON OFF 123456	ON OFF 1234567891 0

The black square (■) indicates a switch position.

LED on indoor board for service

Mark	Meaning	Function
LED1	Main power supply	Main power supply (Indoor unit:220-240V) Power on→Lamp is lit.
LED2	Power supply for MA-Remote controller	Power supply for MA-Remote controller on→Lamp is lit.

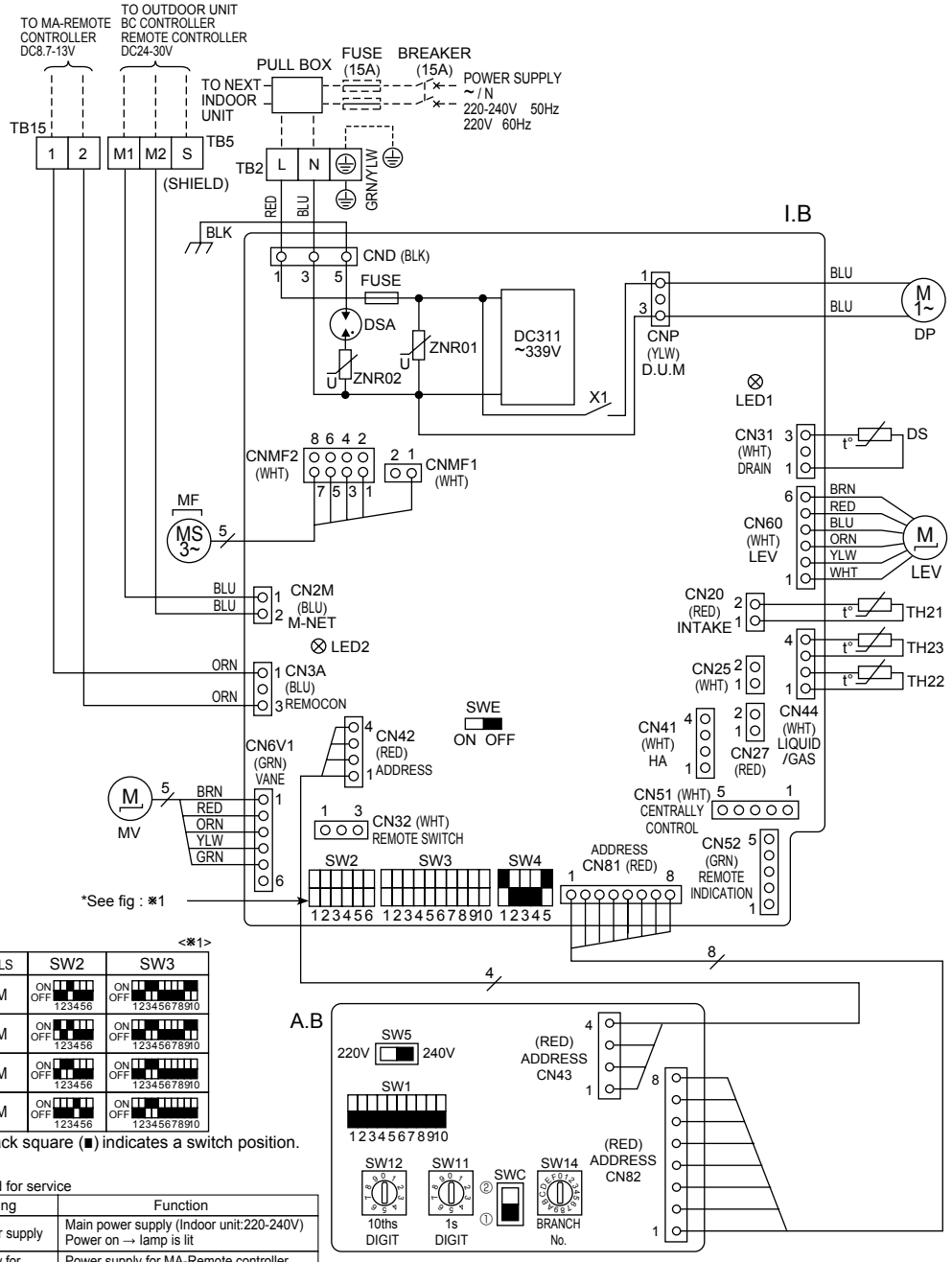
[LEGEND]

SYMBOL	NAME		SYMBOL		NAME
I.B	INDOOR CONTROLLER BOARD		TB2	TERMINAL BLOCK	POWER SUPPLY
CN25	CONNECTOR	HUMIDIFIER	TB5		TRANSMISSION
CN27		DAMPER	TB15		MA-REMOTE CONTROLLER
CN32		REMOTE SWITCH	TH21	THERMISTOR	ROOM TEMP. DETECTION (0℃/15kΩ, 25℃/5.4kΩ)
CN51		CENTRALLY CONTROL			
CN52		REMOTE INDICATION	TH22		PIPE TEMP. DETECTION / LIQUID (0℃/15kΩ, 25℃/5.4kΩ)
SW2	SWITCH	CAPACITY CODE			
SW3		MODE SELECTION	TH23		PIPE TEMP. DETECTION / GAS (0℃/15kΩ, 25℃/5.4kΩ)
SW4		MODEL SELECTOR			
ZNR	VARISTOR		LEV	LINEAR EXPANSION VALVE	
FUSE	FUSE (6.3A / 250V)		A.B	CIRCUIT BOARD	
X1	AUX.RELAY	DRAIN PUMP	SW1	SWITCH	MODE SELECTION
T	TRANSFORMER		SW5		VOLTAGE SELECTION
LED1	POWER SUPPLY(I.B)		SW11		ADDRESS SETTING 1s DIGIT
LED2	POWER SUPPLY(I.B)		SW12		ADDRESS SETTING 10ths DIGIT
MF	FAN MOTOR		SW14		BRANCH No.
MV	VANE MOTOR				
DP	DRAIN PUMP				
DS	DRAIN SENSOR				

NOTES:

1. At servicing for outdoor unit, always follow the wiring diagram of outdoor unit.
2. In case of using MA-Remote controller, please connect to TB15. (Remote controllerwire is non-polar.)
3. In case of using M-NET, please connect to TB5. (Transmission wire is non-polar.)
4. Symbol [S] of TB5 is the shield wire connection.
5. Symbols used in wiring diagram above are, ◎:terminal block, □□□:connector.
6. The setting of the SW2 dip switches differs in the capacity. For the detail, refer to the table above.
7. Please set the switch SW5 according to the power supply voltage. Set SW5 to 240V side when the power supply is 230 and 240 volts. When the power supply is 220 volts, set SW5 to 220V side.

PMFY-P20VBM-E#2 PMFY-P25VBM-E#2 PMFY-P32VBM-E#2 PMFY-P40VBM-E#2
PMFY-P20VBM-ER3 PMFY-P25VBM-ER3 PMFY-P32VBM-ER3 PMFY-P40VBM-ER3



<※1>

MODELS	SW2	SW3
P20VBM	ON OFF 123456	ON OFF 12345678910
P25VBM	ON OFF 123456	ON OFF 12345678910
P32VBM	ON OFF 123456	ON OFF 12345678910
P40VBM	ON OFF 123456	ON OFF 12345678910

The black square (■) indicates a switch position.

LED on indoor board for service

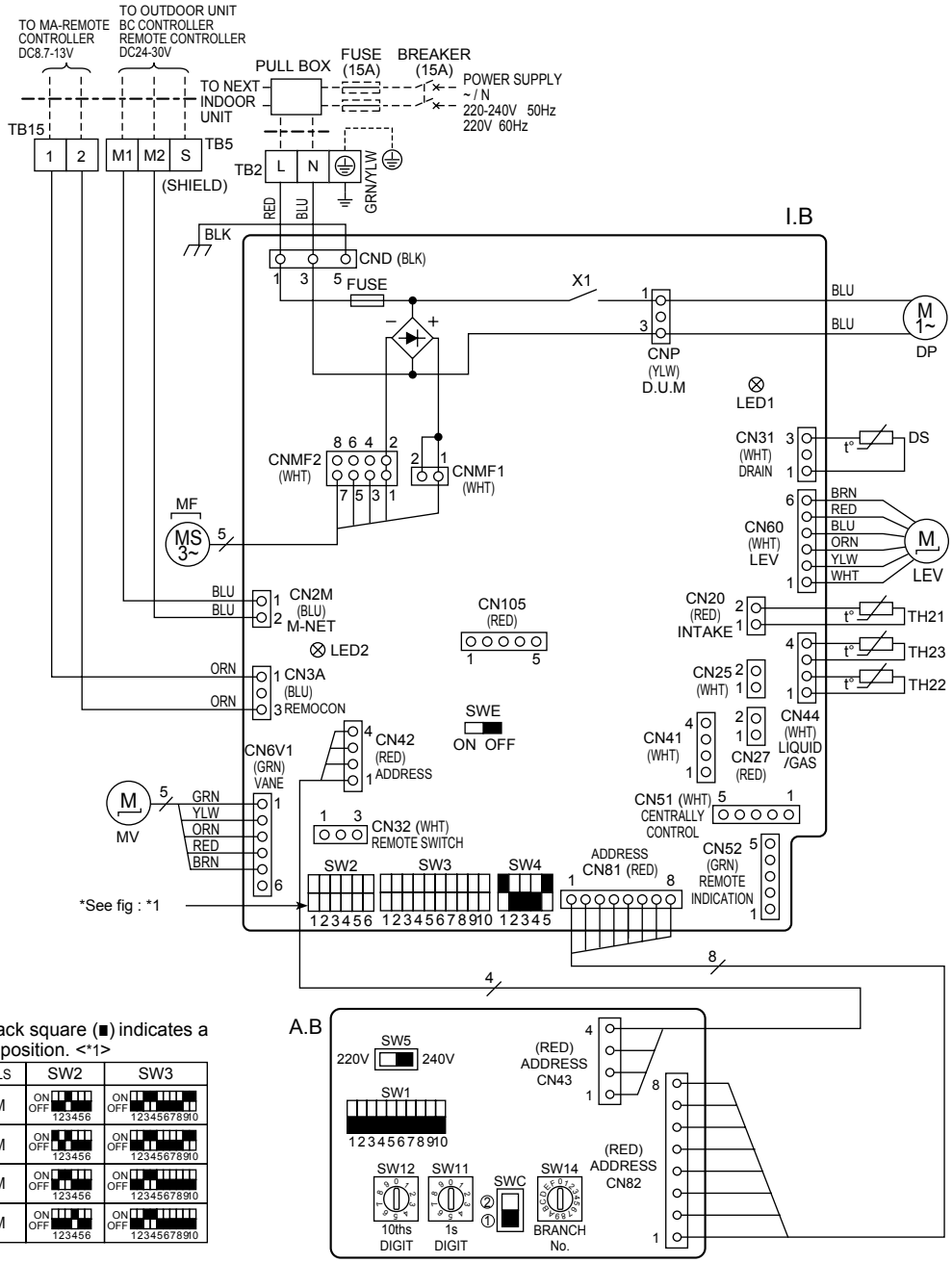
Mark	Meaning	Function
LED1	Main power supply	Main power supply (Indoor unit:220-240V) Power on → lamp is lit
LED2	Power supply for MA-Remote controller	Power supply for MA-Remote controller on → lamp is lit

[LEGEND]

SYMBOL	NAME		SYMBOL	NAME	
I.B	INDOOR CONTROLLER BOARD		DS	DRAIN SENSOR	
CN25	CONNECTOR	HUMIDIFIER	TB2	TERMINAL BLOCK	POWER SUPPLY
CN27		DAMPER	TB5		TRANSMISSION
CN32		REMOTE SWITCH	TB15		MA-REMOTE CONTROLLER
CN51		CENTRALLY CONTROL	TH21	THERMISTOR	ROOM TEMP. DETECTION (0°C/15kΩ, 25°C/5.4kΩ)
CN52		REMOTE INDICATION			
SW2	SWITCH	CAPACITY CORD	TH22		PIPE TEMP. DETECTION / LIQUID (0°C/15kΩ, 25°C/5.4kΩ)
SW3		MODE SELECTION			
SW4		MODEL SELECTOR	TH23		PIPE TEMP. DETECTION / GAS (0°C/15kΩ, 25°C/5.4kΩ)
SWE		DRAIN UP MACHINE(TEST MODE)			
ZNR	VARISTOR		LEV	LINEAR EXPANSION VALVE	
FUSE	FUSE (T6.3AL 250V)		A.B	CIRCUIT BOARD	
X1	AUX.RELAY	DRAIN PUMP	SW1	SWITCH	MODE SELECTION
LED1	POWER SUPPLY (I.B)		SW5		VOLTAGE SELECTION
LED2	POWER SUPPLY (I.B)		SW11		ADDRESS SETTING 1s DIGIT
MF	FAN MOTOR		SW12		ADDRESS SETTING 10ths DIGIT
MV	VANE MOTOR		SW14		BRANCH No.
DP	DRAIN PUMP				

NOTES:
1.At servicing for outdoor unit,always follow the wiring diagram of outdoor unit.
2.In case of using MA-Remote controller, please connect to TB15.
(Remote controller wire is non-polar.)
3.In case of using M-NET, please connect to TB5. (Transmission line is non-polar.)
4.Symbol [S] of TB5 is the shield wire connection.
5.Symbols used in wiring diagram above are,
□□□ : terminal block, ⊙⊙⊙ :connecter.
6.The setting of the SW2 dip switches differs in the capacity. For the detail, refer to the table below.
7.Please set the switch SW5 according to the power supply voltage.
Set SW5 to 240V side when the power supply is 230 and 240 volts.
When the power supply is 220 volts, set SW5 to 220V side.

PMFY-P20VBM-ER4 PMFY-P25VBM-ER4 PMFY-P32VBM-ER4 PMFY-P40VBM-ER4



The black square (■) indicates a switch position. <*1>

MODELS	SW2	SW3
P20VBM	ON OFF 123456	ON OFF 1234567890
P25VBM	ON OFF 123456	ON OFF 1234567890
P32VBM	ON OFF 123456	ON OFF 1234567890
P40VBM	ON OFF 123456	ON OFF 1234567890

[LEGEND]

SYMBOL	NAME		SYMBOL	NAME	
I.B	INDOOR CONTROLLER BOARD		DS	DRAIN SENSOR	
CN25	CONNECTOR	HUMIDIFIER	TB2	TERMINAL BLOCK	POWER SUPPLY
CN27		DAMPER	TB5		TRANSMISSION
CN32		REMOTE SWITCH	TB15		MA-REMOTE CONTROLLER
CN51		CENTRALLY CONTROL	TH21	THERMISTOR	ROOM TEMP. DETECTION (0°C/15kΩ, 25°C/5.4kΩ)
CN52		REMOTE INDICATION			
CN105		IT TERMINAL	TH22		PIPE TEMP. DETECTION / LIQUID (0°C/15kΩ, 25°C/5.4kΩ)
SW2	SWITCH	CAPACITY CORD			
SW3		MODE SELECTION	TH23		PIPE TEMP. DETECTION / GAS (0°C/15kΩ, 25°C/5.4kΩ)
SW4		MODEL SELECTOR			
SWE		DRAIN UP MACHINE (TEST MODE)	LEV	LINEAR EXPANSION VALVE	
FUSE	FUSE (T6.3AL 250V)		A.B	CIRCUIT BOARD	
X1	AUX.RELAY	DRAIN PUMP	SW1	SWITCH	MODE SELECTION
LED1	POWER SUPPLY (I.B)		SW5		VOLTAGE SELECTION
LED2	POWER SUPPLY (I.B)		SW11		ADDRESS SETTING 1s DIGIT
MF	FAN MOTOR		SW12		ADDRESS SETTING 10ths DIGIT
MV	VANE MOTOR		SW14		BRANCH No.
DP	DRAIN PUMP				

NOTES:
1. At servicing for outdoor unit,always follow the wiring diagram of outdoor unit.
2. In case of using MA-Remote controller, please connect to TB15. (Remote controller wire is non-polar.)
3. In case of using M-NET, please connect to TB5. (Transmission line is non-polar.)
4. Symbol [S] of TB5 is the shield wire connection.
5. Symbols used in wiring diagram above are, □□□ : terminal block, ○○○ :connecter.
6. The setting of the SW2 dip switches differs in the capacity. For the detail, refer to the table below.
7. Please set the switch SW5 according to the power supply voltage. Set SW5 to 240V side when the power supply is 230 and 240 volts. When the power supply is 220 volts, set SW5 to 220V side.

LED on indoor board for service

Mark	Meaning	Function
LED1	Main power supply	Main power supply (Indoor unit:220-240V) Power on → lamp is lit
LED2	Power supply for MA-Remote controller	Power supply for MA-Remote controller on → lamp is lit

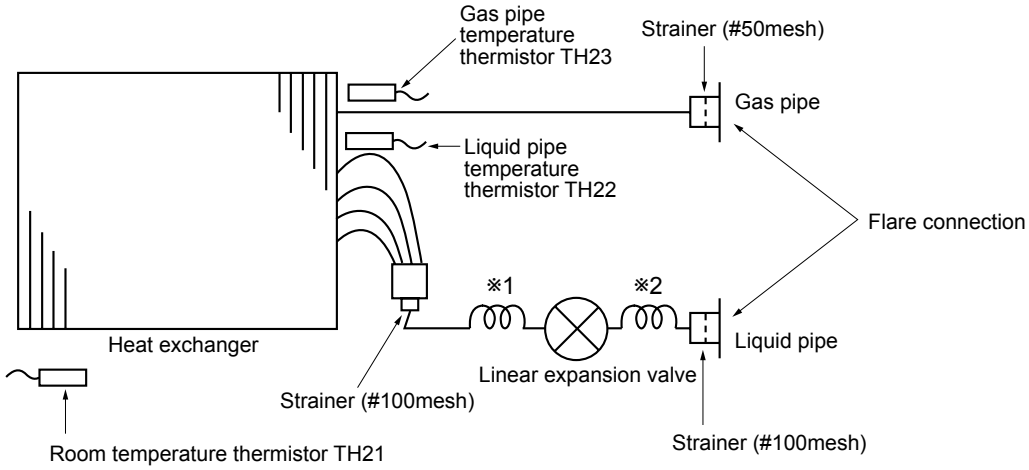
7 REFRIGERANT SYSTEM DIAGRAM

PMFY-P20VBM-E
PMFY-P20VBM-E$_1$
PMFY-P20VBM-E#2
PMFY-P20VBM-ER3
PMFY-P20VBM-ER4

PMFY-P25VBM-E
PMFY-P25VBM-E$_1$
PMFY-P25VBM-E#2
PMFY-P25VBM-ER3
PMFY-P25VBM-ER4

PMFY-P32VBM-E
PMFY-P32VBM-E$_1$
PMFY-P32VBM-E#2
PMFY-P32VBM-ER3
PMFY-P32VBM-ER4

PMFY-P40VBM-E
PMFY-P40VBM-E$_1$
PMFY-P40VBM-E#2
PMFY-P40VBM-ER3
PMFY-P40VBM-ER4



Unit: mm (inch)

Item \ Service Ref.	PMFY-P20, P25, P32, P40VBM-E PMFY-P20, P25, P32, P40VBM-E$_1$ PMFY-P20, P25, P32, P40VBM-E#2 PMFY-P20, P25, P32, P40VBM-ER3 PMFY-P20, P25, P32, P40VBM-ER4
Gas pipe	ϕ12.7(1/2")
Liquid pipe	ϕ6.35(1/4")

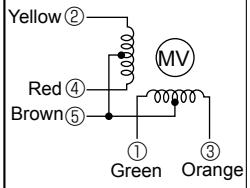
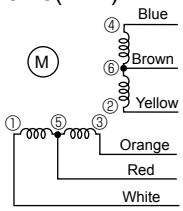
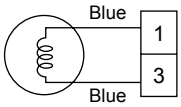
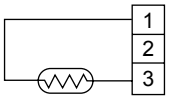
Unit: mm

	PMFY-P20, P25VBM-E PMFY-P20, P25VBM-E$_1$ PMFY-P20, P25VBM-E#2 PMFY-P20, P25VBM-ER3 PMFY-P20, P25VBM-ER4	PMFY-P32, P40VBM-E PMFY-P32, P40VBM-E$_1$ PMFY-P32, P40VBM-E#2 PMFY-P32, P40VBM-ER3 PMFY-P32, P40VBM-ER4
Capillary tube ※1	O.D.ϕ4.6 × I.D.ϕ3.4 × ℓ 200	O.D.ϕ3.6 × I.D.ϕ2.4 × ℓ 200
Capillary tube ※2	O.D.ϕ3.6 × I.D.ϕ2.4 × ℓ 80	

8 TROUBLE SHOOTING

8-1. HOW TO CHECK THE PARTS

PMFY-P20VBM-E **PMFY-P25VBM-E** **PMFY-P32VBM-E** **PMFY-P40VBM-E**
PMFY-P20VBM-E$_1$ **PMFY-P25VBM-E$_1$** **PMFY-P32VBM-E$_1$** **PMFY-P40VBM-E$_1$**
PMFY-P20VBM-E#2 **PMFY-P25VBM-E#2** **PMFY-P32VBM-E#2** **PMFY-P40VBM-E#2**
PMFY-P20VBM-ER3 **PMFY-P25VBM-ER3** **PMFY-P32VBM-ER3** **PMFY-P40VBM-ER3**
PMFY-P20VBM-ER4 **PMFY-P25VBM-ER4** **PMFY-P32VBM-ER4** **PMFY-P40VBM-ER4**

<table>
<tr><th>Parts name</th><th>Check points</th></tr>
<tr><td>Room temperature thermistor (TH21)
Liquid pipe temperature thermistor (TH22)
Gas pipe temperature thermistor (TH23)</td><td>Disconnect the connector then measure the resistance with a tester.
(At the ambient temperature 10℃ - 30℃)
<table><tr><th>Normal</th><th>Abnormal</th></tr><tr><td>4.3kΩ~9.6kΩ</td><td>Open or short</td></tr></table>Refer to the next page for the details.</td></tr>
<tr><td>Vane motor (MV)
 
</td><td>Measure the resistance between the terminals with a tester.
(At the ambient temperature 20℃ - 30℃)
<table><tr><th>Connector</th><th>Normal</th><th>Abnormal</th></tr><tr><td>Brown — Yellow</td><td rowspan="4">380Ω ±7%</td><td rowspan="4">Open or short</td></tr><tr><td>Brown — Red</td></tr><tr><td>Brown — Orange</td></tr><tr><td>Brown — Green</td></tr></table></td></tr>
<tr><td>Linear expansion valve(LEV)
 
</td><td>Disconnect the connector then measure the resistance valve with a tester.
Refer to the next page for a detail.
<table><tr><th colspan="4">Normal</th><th>Abnormal</th></tr><tr><td>(1)-(5)
White-Red</td><td>(2)-(6)
Yellow-Brown</td><td>(3)-(5)
Orange-Red</td><td>(4)-(6)
Blue-Brown</td><td rowspan="2">Open or short</td></tr><tr><td colspan="4">200Ω ±10%</td></tr></table>Refer to the next page for the details.</td></tr>
<tr><td>Drain pump (DP)
 
</td><td>Measure the resistance between the terminals with a tester.
(At the ambient temperature 20℃)
<table><tr><th>Normal</th><th>Abnormal</th></tr><tr><td>400Ω~480Ω</td><td>Open or short</td></tr></table></td></tr>
<tr><td>Drain sensor (DS)
 
</td><td>Measure the resistance after 3 minutes have passed since the power supply was intercepted.
(At the ambient temperature 0℃ - 60℃)
<table><tr><th>Normal</th><th>Abnormal</th></tr><tr><td>0.6kΩ~6.0kΩ</td><td>Open or short</td></tr></table>Refer to the next page for the details.</td></tr>
</table>

<Thermistor Characteristic graph>

Thermistor for lower temperature

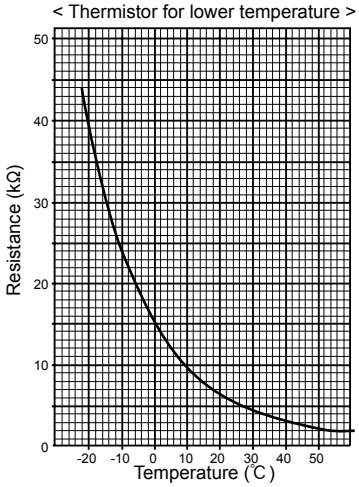
Room temperature thermistor (TH21)
Liquid pipe temperature thermistor (TH22)
Gas pipe temperature thermistor (TH23)

Thermistor R_0=15kΩ ± 3%
Fixed number of B=3480 ± 2%

$$Rt=15\exp\{3480(\frac{1}{273+t}-\frac{1}{273})\}$$

0℃ : 15kΩ
10℃ : 9.6kΩ
20℃ : 6.3kΩ
25℃ : 5.4kΩ
30℃ : 4.3kΩ
40℃ : 3.0kΩ

< Thermistor for lower temperature >



Thermistor for lower temperature

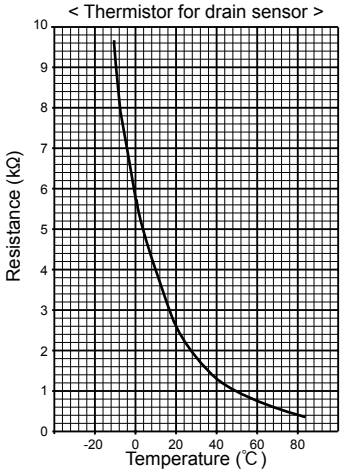
Drain sensor (DS)

Thermistor R_0=6.0kΩ ± 3%
Fixed number of B=3390 ± 2%

$$Rt=6\exp\{3390(\frac{1}{273+t}-\frac{1}{273})\}$$

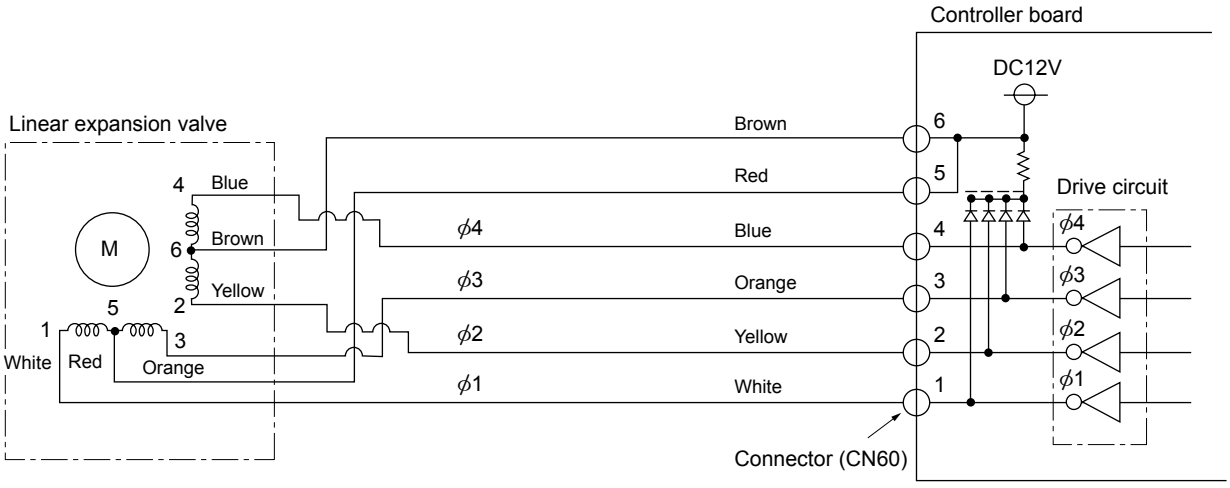
0℃ : 6 kΩ
10℃ : 3.9kΩ
20℃ : 2.6kΩ
25℃ : 2.2kΩ
30℃ : 1.8kΩ
40℃ : 1.3kΩ

< Thermistor for drain sensor >



Linear expansion valve

① Operation summary of the linear expansion valve
• Linear expansion valve open/close through stepping motor after receiving the pulse signal from the indoor controller board.
• Valve position can be changed in proportion to the number of pulse signal.
<Connection between the indoor controller board and the linear expansion valve>



Note : Since the number of the connector at the controller board side and the relay connector are different, follow the colour of the lead wire.

<Output pulse signal and the valve operation>

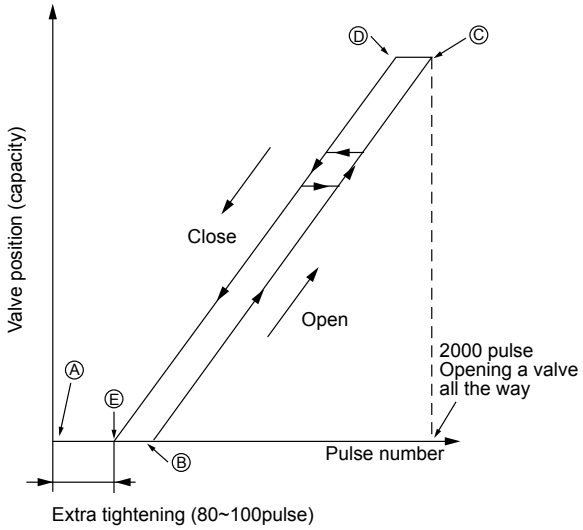
Output (Phase)	Output			
	1	2	3	4
ϕ1	ON	OFF	OFF	ON
ϕ2	ON	ON	OFF	OFF
ϕ3	OFF	ON	ON	OFF
ϕ4	OFF	OFF	ON	ON

Closing a valve : 1 → 2 → 3 → 4 → 1
Opening a valve : 4 → 3 → 2 → 1 → 4

The output pulse shifts in above order.

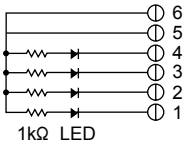
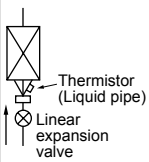
- When linear expansion valve operation stops, all output phase become OFF.
- At phase interruption or when phase does not shift in order, motor does not rotate smoothly and motor will lock and vibrate.

② Linear expansion valve operation



- When the switch is turned on, 2200 pulse closing valve signal will be send till it goes to Ⓐ point in order to define the valve position.
- When the valve move smoothly, there is no sound or vibration occurring from the linear expansion valve : however, when the pulse number moves from Ⓔ to Ⓐ or when the valve is locked, more sound can be heard than normal situation.
- Sound can be detected by placing the ear against the screw driver handle while putting the screw driver to the linear expansion valve.

③ Troubleshooting

Symptom	Check points	Countermeasures
Operation circuit failure of the micro processor	Disconnect the connector on the controller board, then connect LED for checking.  1kΩ LED Pulse signal will be sent out for 10 seconds as soon as the main switch is turned on. If there is LED with lights on or lights off, it means the operation circuit is abnormal.	Exchange the indoor controller board at drive circuit failure.
Linear expansion valve mechanism is locked.	Motor will idle and make ticking noise when motor is operated while the linear expansion valve is locked. This ticking sound is the sign of the abnormality.	Exchange the linear expansion valve.
Short or breakage of the motor coil of the linear expansion valve	Measure the resistance between the each coil (red-white, red-orange, brown-yellow, brown-blue) with a tester. It is normal if the resistance is in the range of 200 Ω ± 10%.	Exchange the linear expansion valve.
Valve does not close completely (thermistor leaking).	To check the linear expansion valve, operate the indoor unit in fan mode and at the same time operate other indoor units in cooling mode, then check the pipe temperature <liquid pipe temperature> of the indoor unit by the outdoor multi controller board operation monitor. During fan operation, linear expansion valve is closed completely and if there are some leaking, detecting temperature of the thermistor will go lower. If the detected temperature is much lower than the temperature indicated in the remote controller, it means the valve is not closed all the way.  It is not necessary to exchange the linear expansion valve, if the leakage is small and not making any trouble.	If large amount of refrigerant is leaked, exchange the linear expansion valve.
Wrong connection of the connector or contact failure	Check the color of lead wire and missing terminal of the connector.	Disconnect the connector at the controller board, then check the continuity.

8-2. TROUBLESHOOTING

Check method of indoor fan motor (fan motor / controller board)

① Notes

· High voltage is applied to the connecter (FAN)(CNMF1, 2) for the fan motor. Pay attention to the service.

· Do not pull out the connector (FAN)(CNMF1, 2) for the motor with the power supply on, doing so may result in damage to the board.

(FAN)

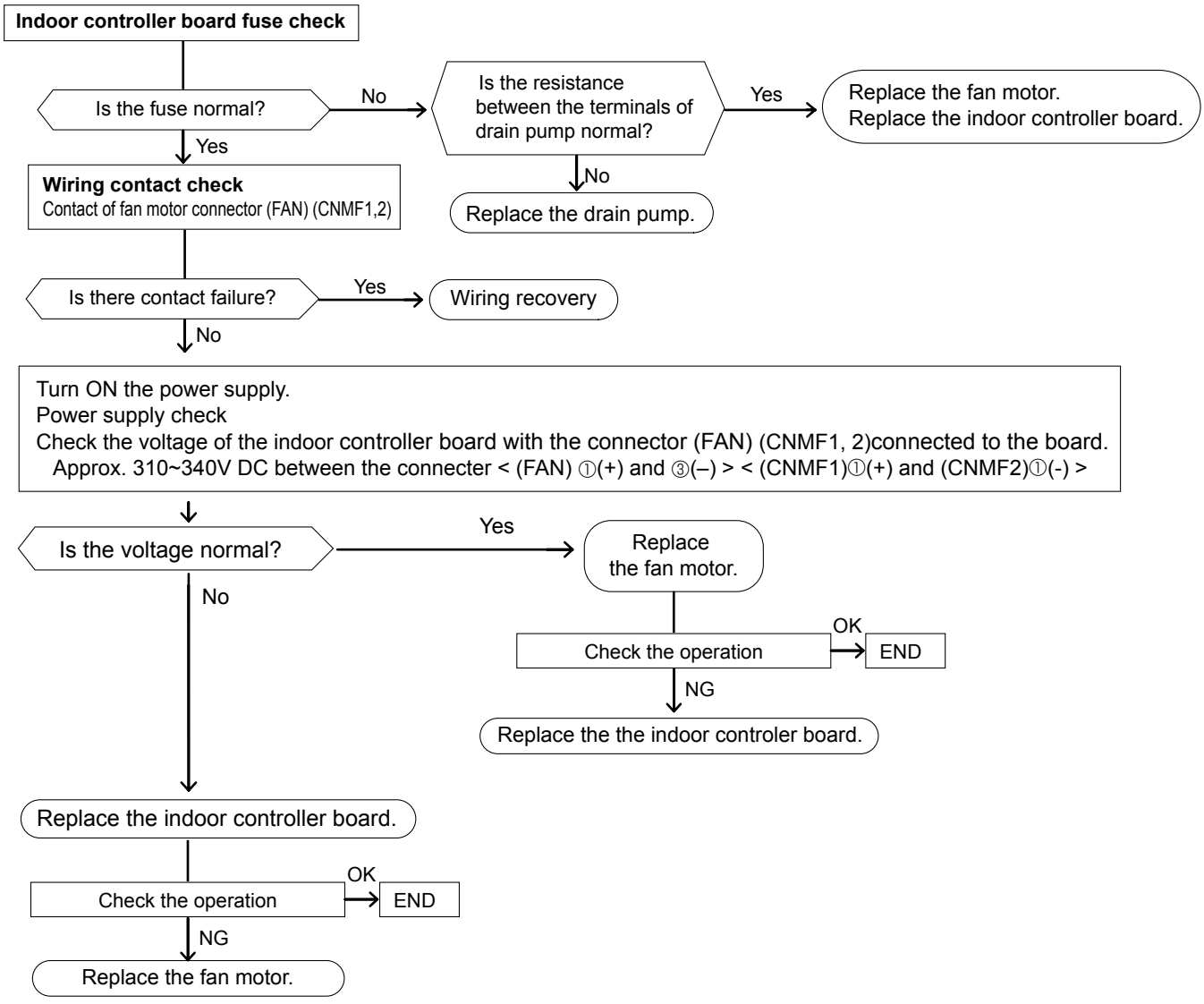
PMFY-P20/25/32/40VBM-E PMFY-P20/25/32/40VBM-E1

(CNMF1, 2)

PMFY-P20/25/32/40VBM-E#2 PMFY-P20/25/32/40VBM-ER3 PMFY-P20/25/32/40VBM-ER4

② Self check

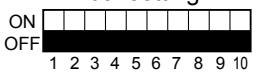
Symptom : The indoor fan can not rotate.



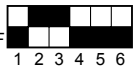
8-3. FUNCTION OF DIP SWITCH

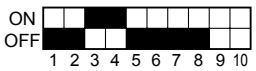
PMFY-P20VBM-E **PMFY-P25VBM-E** **PMFY-P32VBM-E** **PMFY-P40VBM-E**
PMFY-P20VBM-E$_1$ **PMFY-P25VBM-E$_1$** **PMFY-P32VBM-E$_1$** **PMFY-P40VBM-E$_1$**
PMFY-P20VBM-E#2 **PMFY-P25VBM-E#2** **PMFY-P32VBM-E#2** **PMFY-P40VBM-E#2**
PMFY-P20VBM-ER3 **PMFY-P25VBM-ER3** **PMFY-P32VBM-ER3** **PMFY-P40VBM-ER3**
PMFY-P20VBM-ER4 **PMFY-P25VBM-ER4** **PMFY-P32VBM-ER4** **PMFY-P40VBM-ER4**

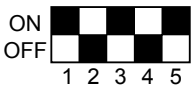
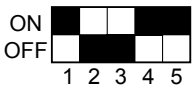
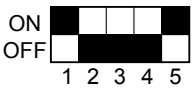
The black square (■) indicates a switch position.

Switch	Pole	Function	Operation by switch ON	Operation by switch OFF	Effective timing	Remarks
SW1 Mode Selection	1	Thermistor <Room temperature detection> position	Bult-in remote controller	Indoor unit	Under suspension	Address board <Initial setting>  *1
	2	Filter clogging detection	Provided	Not provided		
	3	Filter cleaning sign	2,500h	100h		
	4	Fresh air intake	Effective	Not effective		
	5	Switching remote display	Thermo ON signal indication	Fan output indication		
	6	Humidifier control	Fan operation at Heating mode	Thermo On operation at heating mode		
	7	Air flow at	Low *1	Extra low *1		
	8	Heat thermo OFF	Setting air flow	Depends on SW1-7		
	9	Auto restart function	Effective	Not effective		
	10	Power source ON/OFF	Effective	Not effective		

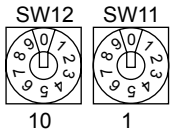
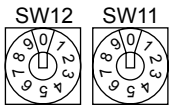
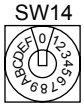
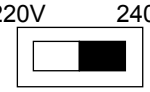
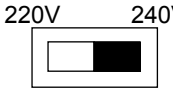
SW1-7	SW1-8	SW 1-8
OFF	OFF	Extra low
ON	OFF	Low
OFF	ON	Setting air flow
ON	ON	stop

SW2 Capacity code setting	1~6	Capacity	SW 2	Capacity	SW 2	Before power supply ON	Indoor controller board <Initial setting> Set for each capacity.
		P20		P32			
		P25		P40			

SW3 Function Selection	1	Heat pump / Cool only	Cooling only	Heat pump	Under suspension	Indoor controller board Set while the unit is off. <Initial setting>  *2 At cooling mode, each angle can be used only 1 hour. *3 Please do not change SW3-9 and SW3-10. See 6. WIRING DIAGRAM. *4 Second setting means first setting.
	2	Louver	Available	Not available		
	3	Vane	Available	Not available		
	4	Vane swing function	Available	Not available		
	5	Vane horizontal angle	Second setting *4	First setting		
	6	Vane cooling limit angle setting *2	Horizontal angle	Down B, C		
	7	Indoor linear expansion valve opening change	Effective	Not effective		
	8	Heating 4deg. up	Not effective	Effective		
	9	Target superheat setting *3	—	—		
	10	Target sub cool setting *3	—	—		

SW4 Unit Selection	1~5	PMFY-P·VBM-E	PMFY-P·VBM-E$_1$	PMFY-P·VBM-E#2/ER3/ER4	Before power supply ON	Indoor controller board
						

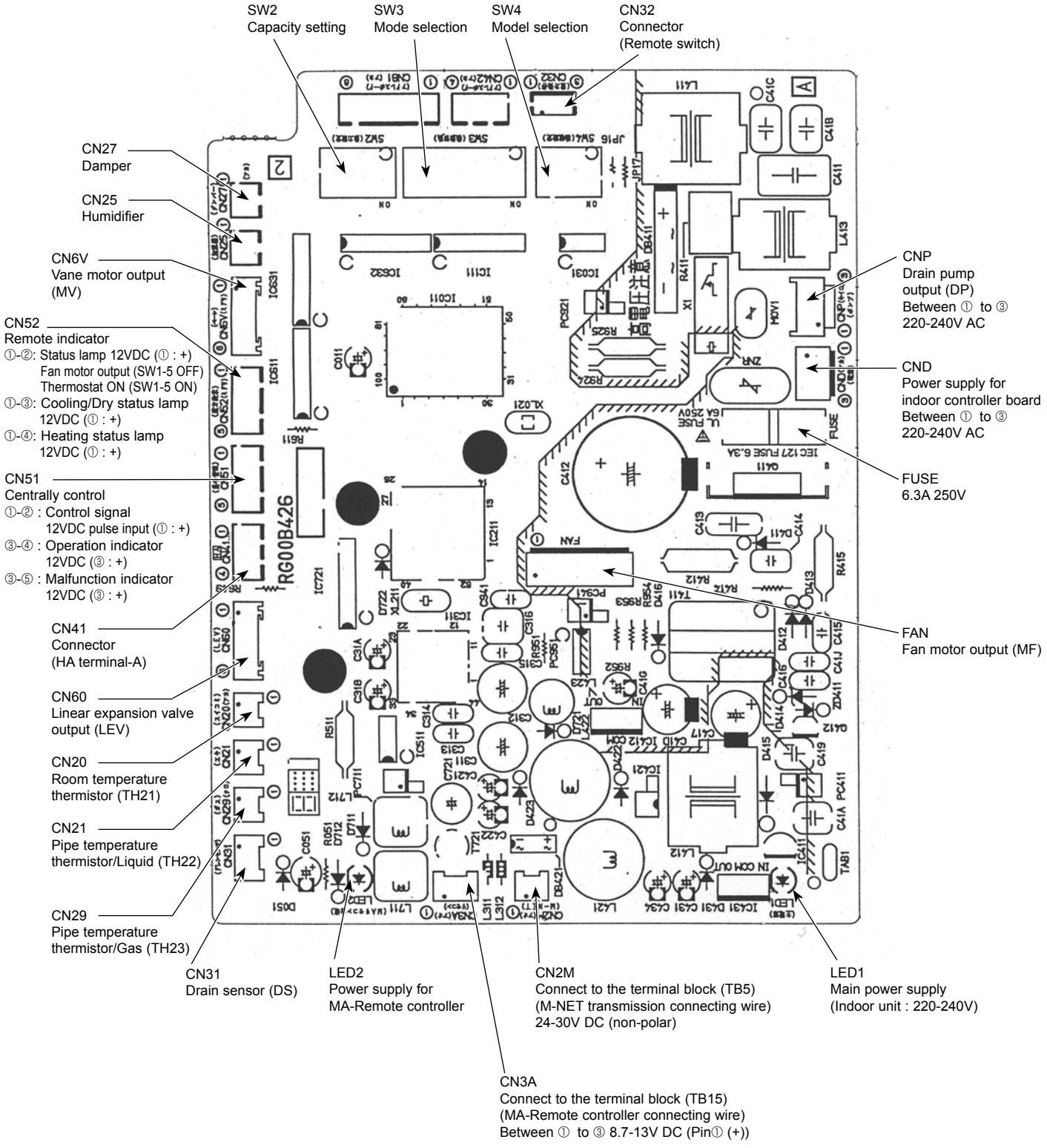
The black square (■) indicates a switch position.

Switch	Pole	Operation by switch	Effective timing	Remarks
SW11 1s digit address setting SW12 10ths digit address setting	Rotary switch	 How to set addresses Example : If address is “3”, remain SW12 (for over 10) at “0”, and match SW11 (for 1 to 9) with “3”.	Before power supply ON	Address board <Initial setting> 
SW14 Branch No. setting	Rotary switch	 How to set branch numbers SW14 (Series R2 only) Match the indoor unit’s refrigerant pipe with the BC controller’s end connection number. Remain other than series R2 at “0”.		Address board <Initial setting>
SW5 Voltage Selection	2	 If the unit is used at the 230V or 240V area, set the voltage to 240V. If the unit is used at the 220V, set the voltage to 220V.		Address board <Initial setting> 

8-4. TEST POINT DIAGRAM

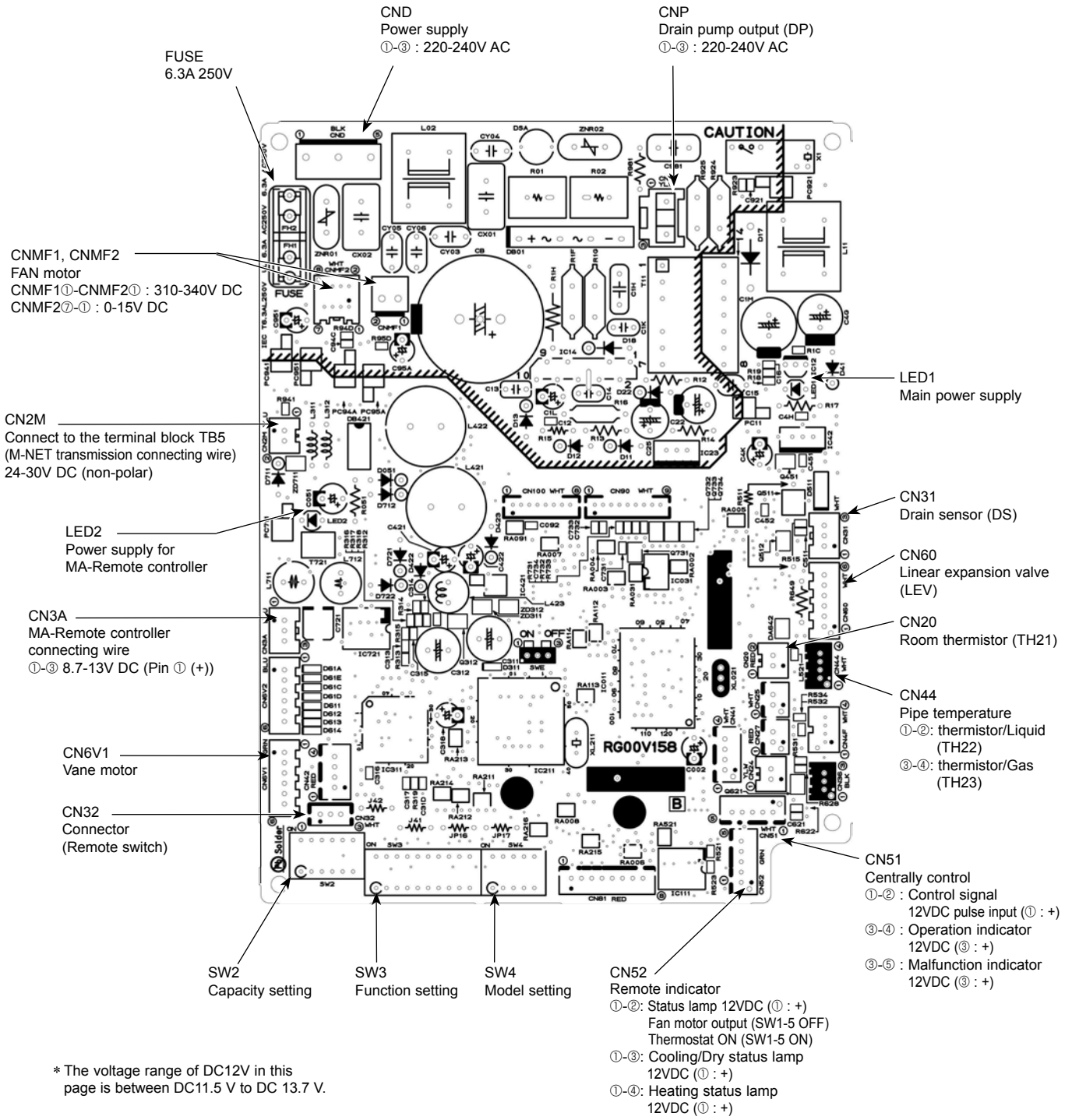
8-4-1. Indoor controller board

PMFY-P20VBM-E **PMFY-P25VBM-E** **PMFY-P32VBM-E** **PMFY-P40VBM-E**
PMFY-P20VBM-E$_1$ **PMFY-P25VBM-E$_1$** **PMFY-P32VBM-E$_1$** **PMFY-P40VBM-E$_1$**



Indoor controller board

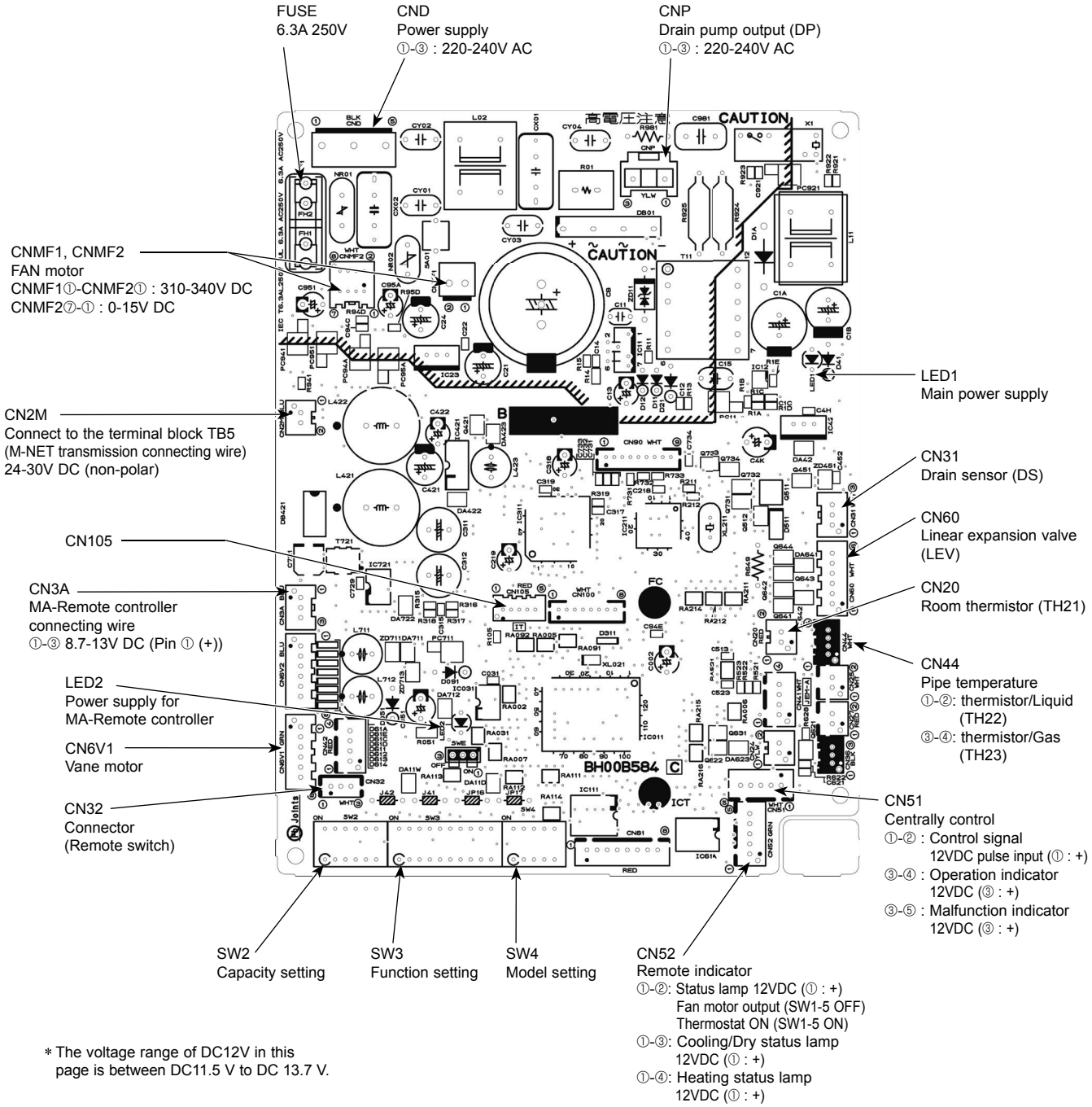
PMFY-P20VBM-E#2 PMFY-P25VBM-E#2 PMFY-P32VBM-E#2 PMFY-P40VBM-E#2
PMFY-P20VBM-ER3 PMFY-P25VBM-ER3 PMFY-P32VBM-ER3 PMFY-P40VBM-ER3
PMFY-P20VBM-ER4 PMFY-P25VBM-ER4 PMFY-P32VBM-ER4 PMFY-P40VBM-ER4



* The voltage range of DC12V in this page is between DC11.5 V to DC 13.7 V.

Indoor controller board

PMFY-P20VBM-E#2 PMFY-P25VBM-E#2 PMFY-P32VBM-E#2 PMFY-P40VBM-E#2
PMFY-P20VBM-ER3 PMFY-P25VBM-ER3 PMFY-P32VBM-ER3 PMFY-P40VBM-ER3
PMFY-P20VBM-ER4 PMFY-P25VBM-ER4 PMFY-P32VBM-ER4 PMFY-P40VBM-ER4



* The voltage range of DC12V in this page is between DC11.5 V to DC 13.7 V.

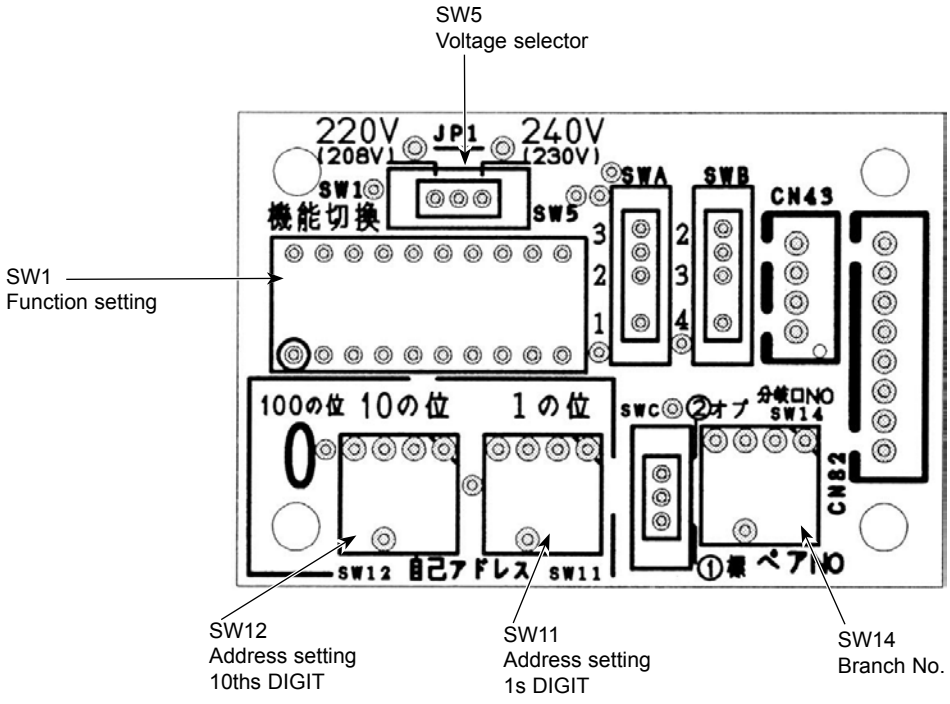
8-4-2. Address board

PMFY-P20VBM-E
PMFY-P20VBM-E$_1$
PMFY-P20VBM-E#2
PMFY-P20VBM-ER3
PMFY-P20VBM-ER4

PMFY-P25VBM-E
PMFY-P25VBM-E$_1$
PMFY-P25VBM-E#2
PMFY-P25VBM-ER3
PMFY-P25VBM-ER4

PMFY-P32VBM-E
PMFY-P32VBM-E$_1$
PMFY-P32VBM-E#2
PMFY-P32VBM-ER3
PMFY-P32VBM-ER4

PMFY-P40VBM-E
PMFY-P40VBM-E$_1$
PMFY-P40VBM-E#2
PMFY-P40VBM-ER3
PMFY-P40VBM-ER4



9 DISASSEMBLY PROCEDURE

PMFY-P20VBM-E
PMFY-P20VBM-E$_1$
PMFY-P20VBM-E#2
PMFY-P20VBM-ER3
PMFY-P20VBM-ER4

PMFY-P25VBM-E
PMFY-P25VBM-E$_1$
PMFY-P25VBM-E#2
PMFY-P25VBM-ER3
PMFY-P25VBM-ER4

PMFY-P32VBM-E
PMFY-P32VBM-E$_1$
PMFY-P32VBM-E#2
PMFY-P32VBM-ER3
PMFY-P32VBM-ER4

PMFY-P40VBM-E
PMFY-P40VBM-E$_1$
PMFY-P40VBM-E#2
PMFY-P40VBM-ER3
PMFY-P40VBM-ER4

Be careful when removing heavy parts.

OPERATING PROCEDURE

1. Removing the grille

Opening the air intake grille

(1) Press the PUSH of the air intake grille. (See Figure 1)
(2) Put your fingers on the both ends of nut of the air intake grille and put it down after the grille clicked.

Removing the air intake grille

(1) Press the PUSH of the air intake grille, and pull down the both ends of nut with your fingers after the grille clicked. (See Figure 1)
(2) Pull out the handle of air intake grille strongly toward you. (See Figure 2)
(3) Draw the string of the air intake grille to prevent the air intake grille from dropping. (See Figure 3)

Checks before setting the grille in place

(1) Before installing the grille, make sure the indoor unit is square with the ceiling opening (or parallel to the angle between the wall and the ceiling).
(2) Check that the 4 points where the grille will be secured are in contact with the ceiling surface.
(3) Check that the insulation for the refrigerant pipes, drainage pipes, etc. is in place and that wiring connections and arrangements are complete.

Figure 4

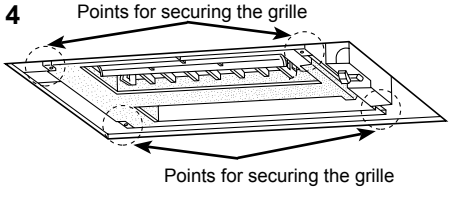
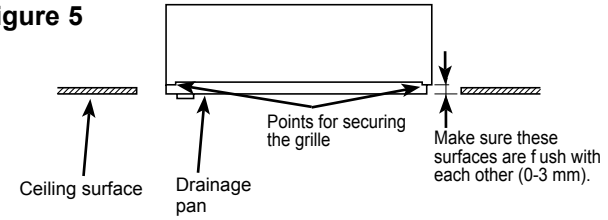


Figure 5



PHOTOS&ILLUSTRATIONS

Photo 1

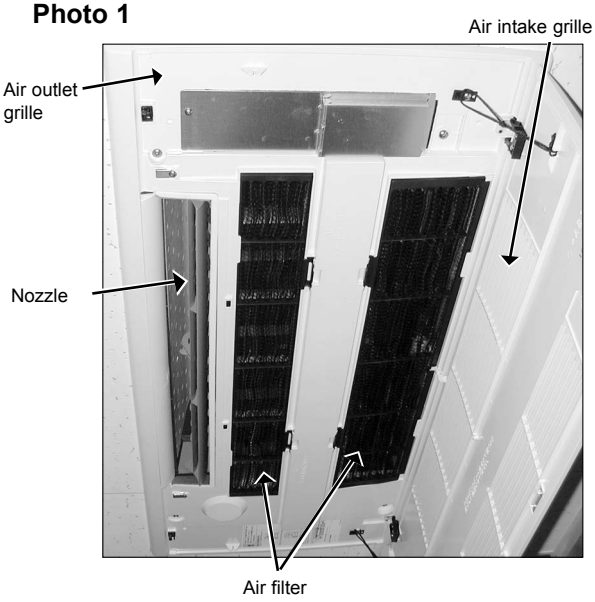


Figure 1

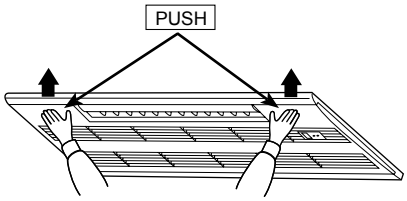


Figure 2

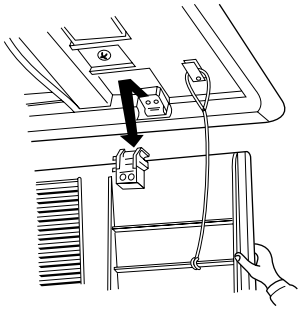
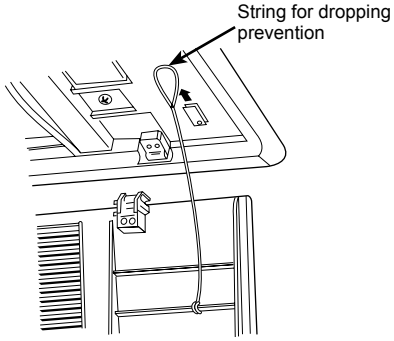


Figure 3



OPERATING PROCEDURE

Removing the grille

(1) Open the intake grille by pressing PUSH of the air intake grille and remove the air filter (× 2). (See Figure 1)
(2) Remove the screw cover in the middle of the air outlet. (See Figure 7)
(3) Open the upper and lower flaps on the indoor unit completely. (See Figure 7)
(4) Remove the securing screws (× 7).
(Ⓐ: M5 × 0.8 × 16, 6pcs)
(Ⓑ: 4 × 16, 1pc)
(5) Remove the temporary holding tabs on the grille to the hooks on the indoor unit.

Attaching the grille

(1) Open the upper and lower flaps on the indoor unit completely.
(2) Hook the temporary holding tabs on the front panel to the hooks on the indoor unit.
(3) Adjust the grille so that it fits properly in the angle between the ceiling and the wall, and install the securing screws Ⓐ (supplied with this grille) in their 4 places at left and right, leaving them slightly loose.
(4) Tighten the securing bolts Ⓐ and securing screws Ⓑ in the centre 3 places. (See Figure 6)
(5) Tighten the securing bolts Ⓐ in the 4 places at left and right.
* Make sure there are no gaps between the indoor unit and the grille, and between the grille and the ceiling surface. If there are gaps, the wind may come in and it may cause water to drip. (See Figure 8)
* Tighten the securing bolts Ⓐ and securing screws Ⓑ completely.
(6) Replace the air filter and screw cover, and press PUSH of the intake grille until you hear it snap into place.

Checks after setting the grille

(1) Check that there are no gaps between the indoor unit and the grille, between the grille and the ceiling surface. If there are gaps, the wind may come in and condensation may result.
(2) Check that the air filter is in place.

PHOTOS&ILLUSTRATIONS

Figure 6

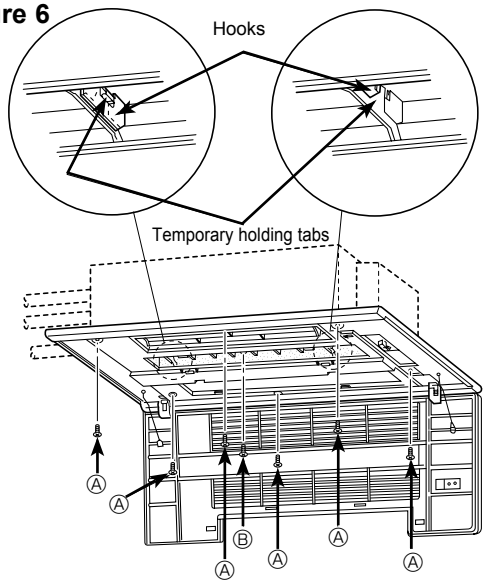


Figure 7

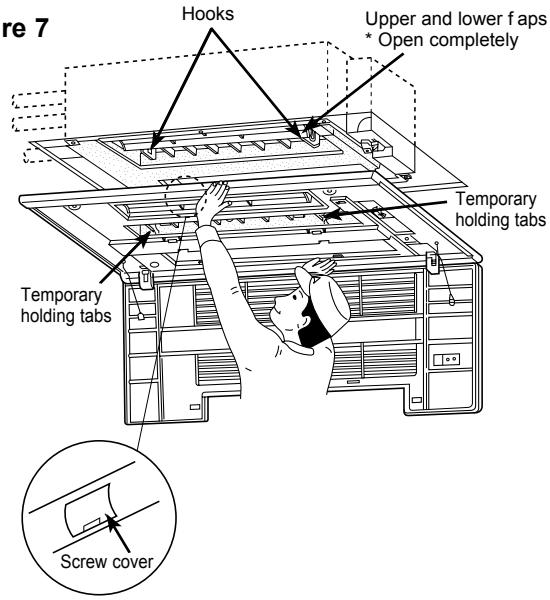
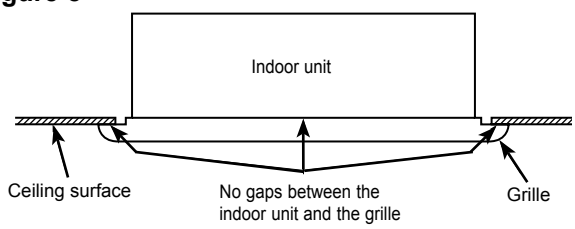
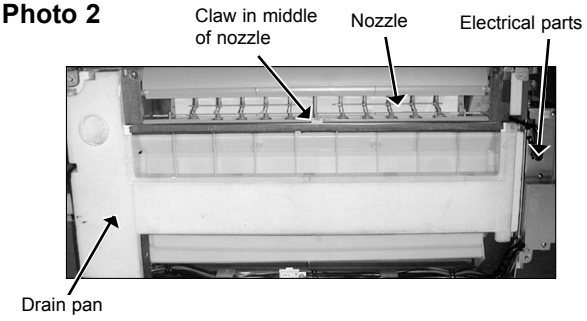
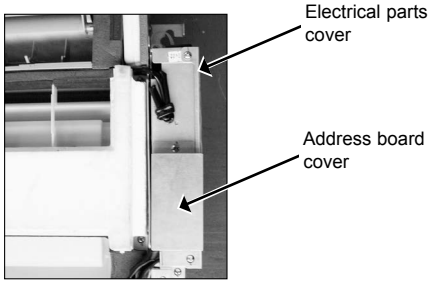
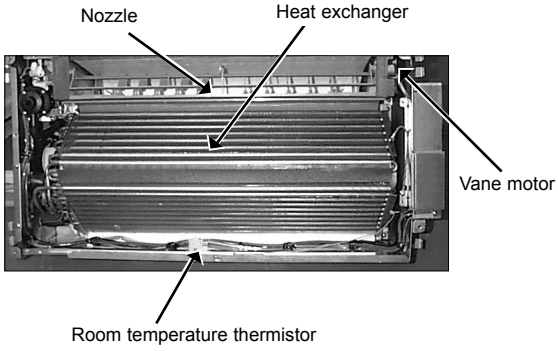
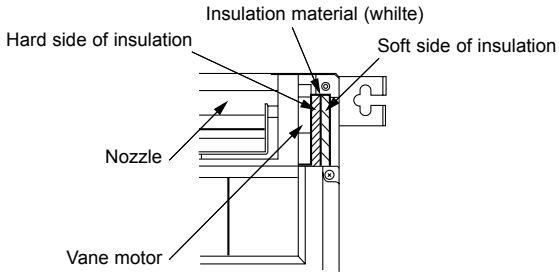
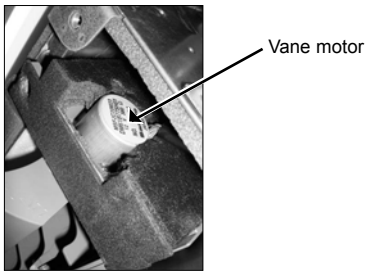
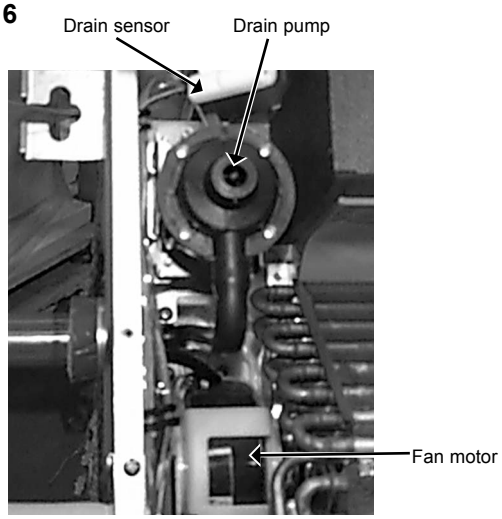
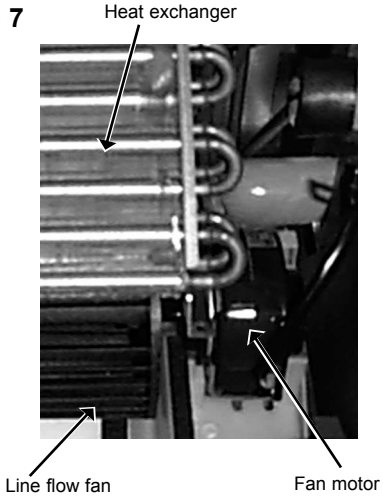


Figure 8



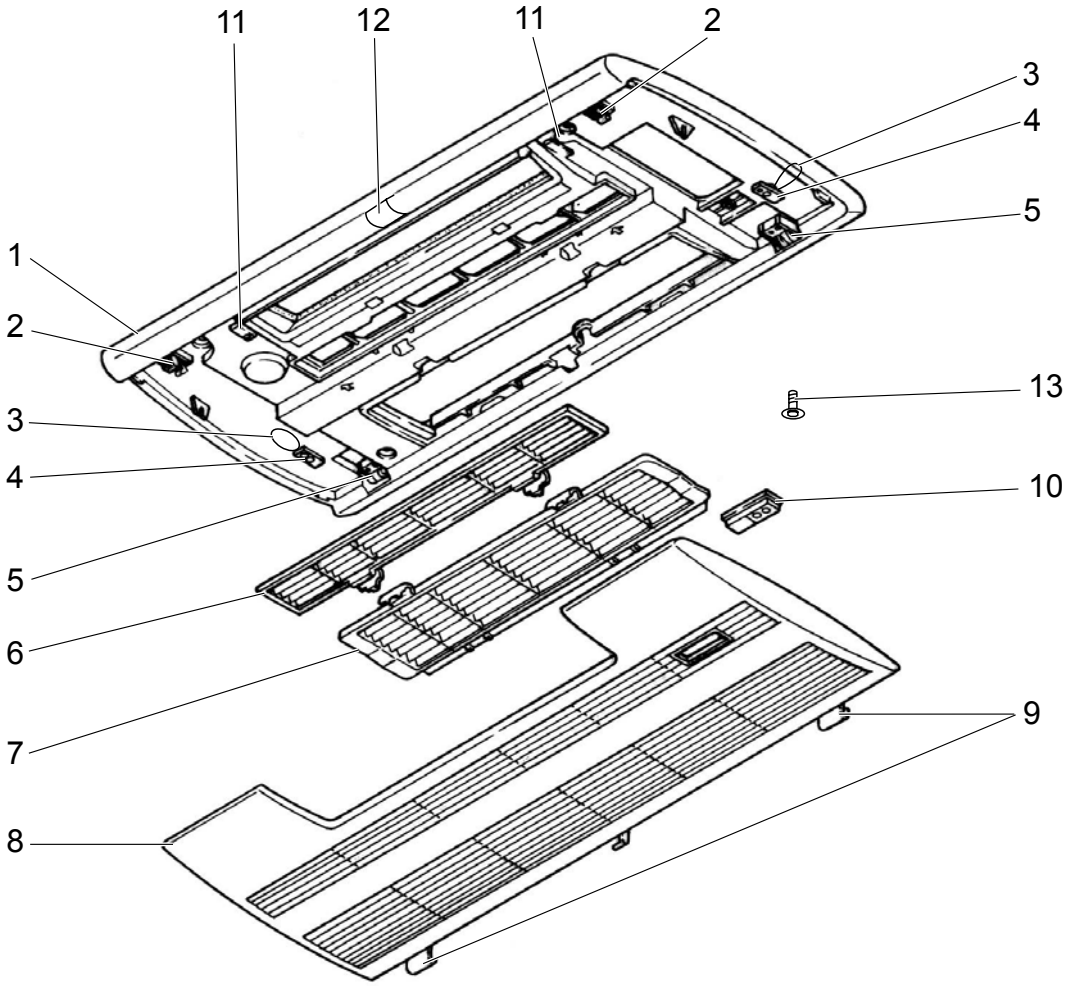
OPERATING PROCEDURE	PHOTOS & ILLUSTRATIONS
2. Removing the electrical parts box (1) Remove the grille. (2) Remove the address board cover. (3) Remove the electrical parts cover. (4) Disconnect the connectors of fan motor, vane motor, drain pump, room temperature thermistor, pipe temperature thermistor (Liquid, Gas), and drain sensor on the electrical controller board. (5) Disconnect the lead wire and earth wire from terminal block. (6) Remove the electrical parts box.	**Photo 2**  **Photo 3** 
3. Removing the nozzle **Note when removing the nozzle** **· The white insulation material which prevents water drop is mounted to the side of vane motor. Remove the insulation material before removing nozzle. (See Figure 9)** **· After completing the service, re-mount the insulation material as before as shown in right figure.** **· After service, mount the double layer insulation without fail. The hard material side should be faced to the nozzle. (See Figure 9)** (1) Remove the grille. (2) Remove the room temperature thermistor. (3) Unhook the claws in the middle of nozzle and remove the drain pan. (5 screws) (See Photo 2) (4) Remove the nozzle side of the heat exchanger. (2 screws) (5) Remove the address board cover. (See Photo 3) (6) Remove the electrical parts cover. (See Photo 3) (7) Disconnect the connector of vane motor. (8) Remove the insulation material (white) on the right side of nozzle. (9) Remove the nozzle. (6 screws)	**Photo 4**  **Figure 9** 
4. Removing the vane motor (1) Remove the nozzle. Refer to above-mentioned 3. Removing the nozzle. (2) Remove the vane motor from the nozzle.	**Photo 5** 

OPERATING PROCEDURE	PHOTOS & ILLUSTRATIONS
5. Removing the drain pump (1) Remove the grille. (2) Unhook the claw in the middle of nozzle and remove the drain pan. (See Photo 2) (3) Remove the address board cover. (See Photo 3) (4) Remove the electrical parts cover. (See Photo 3) (5) Disconnect the connector of drain pump. (6) Remove the drain hose. (7) Remove the drain pump. (2 screws)	**Photo 6** 
6. Removing the fan motor and line flow fan (1) Remove the grille. (2) Unhook the claw in the middle of nozzle and remove the drain pan. (See Photo 2) (3) Unscrew 2 screws at the nozzle side of the heat exchanger. (4) Remove the address board cover. (See Photo 3) (5) Remove the electrical parts cover. (See Photo 3) (6) Disconnect the connector of vane motor, fan motor and drain pump. (7) Remove the nozzle side of the heat exchanger. (2 screws) (8) Remove the nozzle. (9) Remove the drain pump. (10) Unscrew 2 screws in the motor support. (11) Remove the fan motor and line flow fan (The fan motor and line flow fan can be removed without removing the heat exchanger.)	**Photo 7** 
7. Removing the thermistor <Intake temperature detector> (1) Remove the grille. (2) Remove the address board cover. (See Photo 3) (3) Remove the electrical parts cover. (See Photo 3) (4) Remove the thermistor <intake temperature detector>. (5) Disconnect the lead wire from the cord clamp (5 points). (6) Disconnect the connector (CN20) on the indoor controller board.	
8. Removing the thermistor<Liquid pipe temperature detector> <Gas pipe temperature detector> (1) Remove the grille. (2) Remove the address board cover. (See Photo 3) (3) Remove the electrical parts cover. (See Photo 3) (4) Remove the drain pan. (5) Remove the thermistor <Gas pipe temperature detector> /<Liquid pipe temperature detector>. (6) Disconnect the lead wire from the cord clamp. (7) Disconnect the connector (CN21)/(CN29), (CN44) on the indoor controller board. Connector (CN21) / Liquid ($VBM_{(1)}$) (CN29) / Gas ($VBM_{(1)}$) (CN44) / Liquid and Gas (VBM#2, VBMR3, VBMR4)	

10 RoHS PARTS LIST

PANEL PARTS

PMP-40BM (FOR PMFY-P20/25/32/40VBM-E$_{(1)}$)
PMP-40BMW (FOR PMFY-P20/25/32/40VBM-E#2, PMFY-P20/25/32/40VBM-ER3, PMFY-P20/25/32/40VBM-ER4)

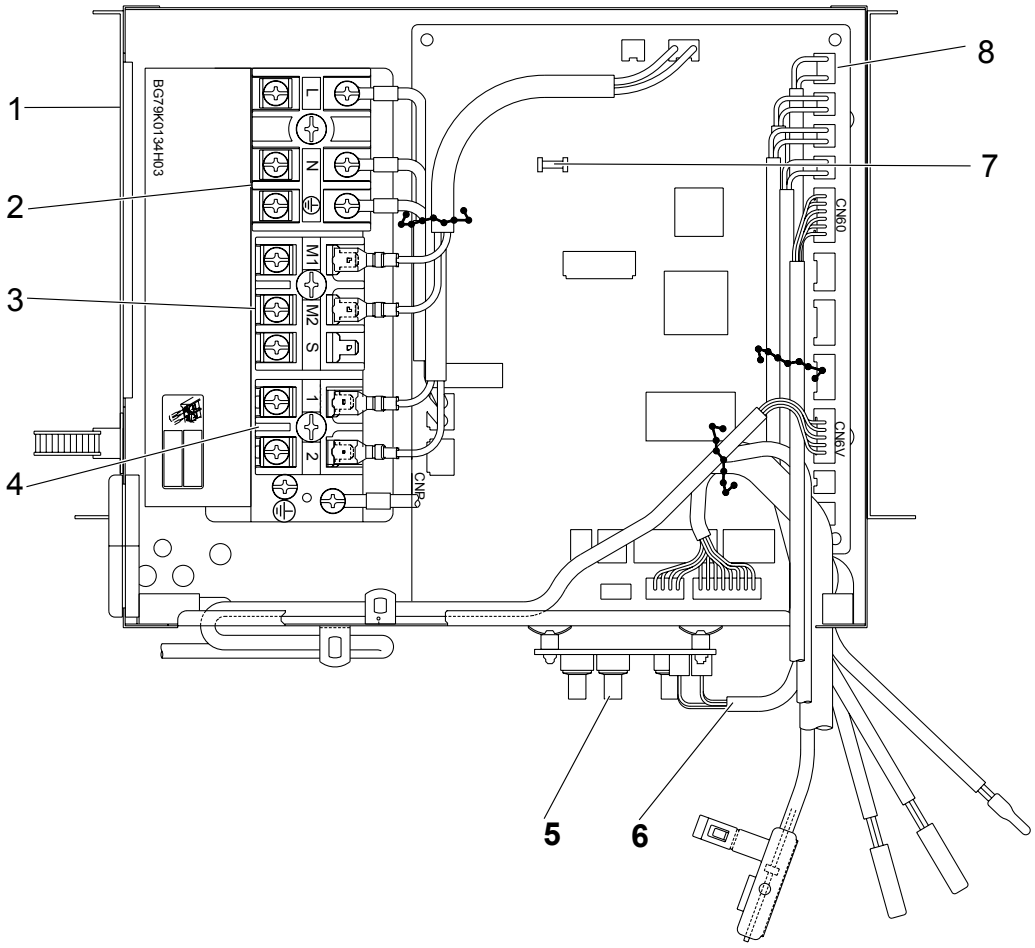


No.	RoHS	Part No.	Part Name	Specification	Q'ty/set		Remarks (Drawing No.)	Wiring Diagram Symbol	Recommended Q'ty
					PMP-40BM	PMP-40BMW			
1	G	T7W E16 003	AIR OUTLET GRILLE		1				
	G	T7W E22 003	AIR OUTLET GRILLE			1			
2	G	R01 E01 055	LATCH		2	2			
3	G	—	HANGER		2	2	(DT88D360H03)		
4	G	R01 E01 099	PANEL HOOK		2	2			
5	G	R01 E07 054	GRILLE CATCH		2	2			
6	G	R01 E14 500	L.L.FILTER		1	1			
7	G	R01 E15 500	L.L.FILTER		1	1			
8	G	T7W E04 691	INTAKE GRILLE		1				
	G	T7W E06 691	INTAKE GRILLE			1			
9	G	R01 E06 054	GRILLE CATCH		2	2			
10	G	R01 E01 648	RECEIVER COVER		1	1			
11	G	R01 E01 044	MAGNET		2	2			
12	G	R01 E04 096	SCREW CAP		1				
	G	R01 E07 096	SCREW CAP			1			
13	G	R01 E03 673	SCREW ASSY		1	1	for PANEL		

RoHS PARTS LIST

ELECTRICAL PARTS

PMFY-P20VBM-E
PMFY-P25VBM-E
PMFY-P32VBM-E
PMFY-P40VBM-E
PMFY-P20VBM-E$_1$
PMFY-P25VBM-E$_1$
PMFY-P32VBM-E$_1$
PMFY-P40VBM-E$_1$
PMFY-P20VBM-E#2
PMFY-P25VBM-E#2
PMFY-P32VBM-E#2
PMFY-P40VBM-E#2
PMFY-P20VBM-ER3
PMFY-P25VBM-ER3
PMFY-P32VBM-ER3
PMFY-P40VBM-ER3
PMFY-P20VBM-ER4
PMFY-P25VBM-ER4
PMFY-P32VBM-ER4
PMFY-P40VBM-ER4



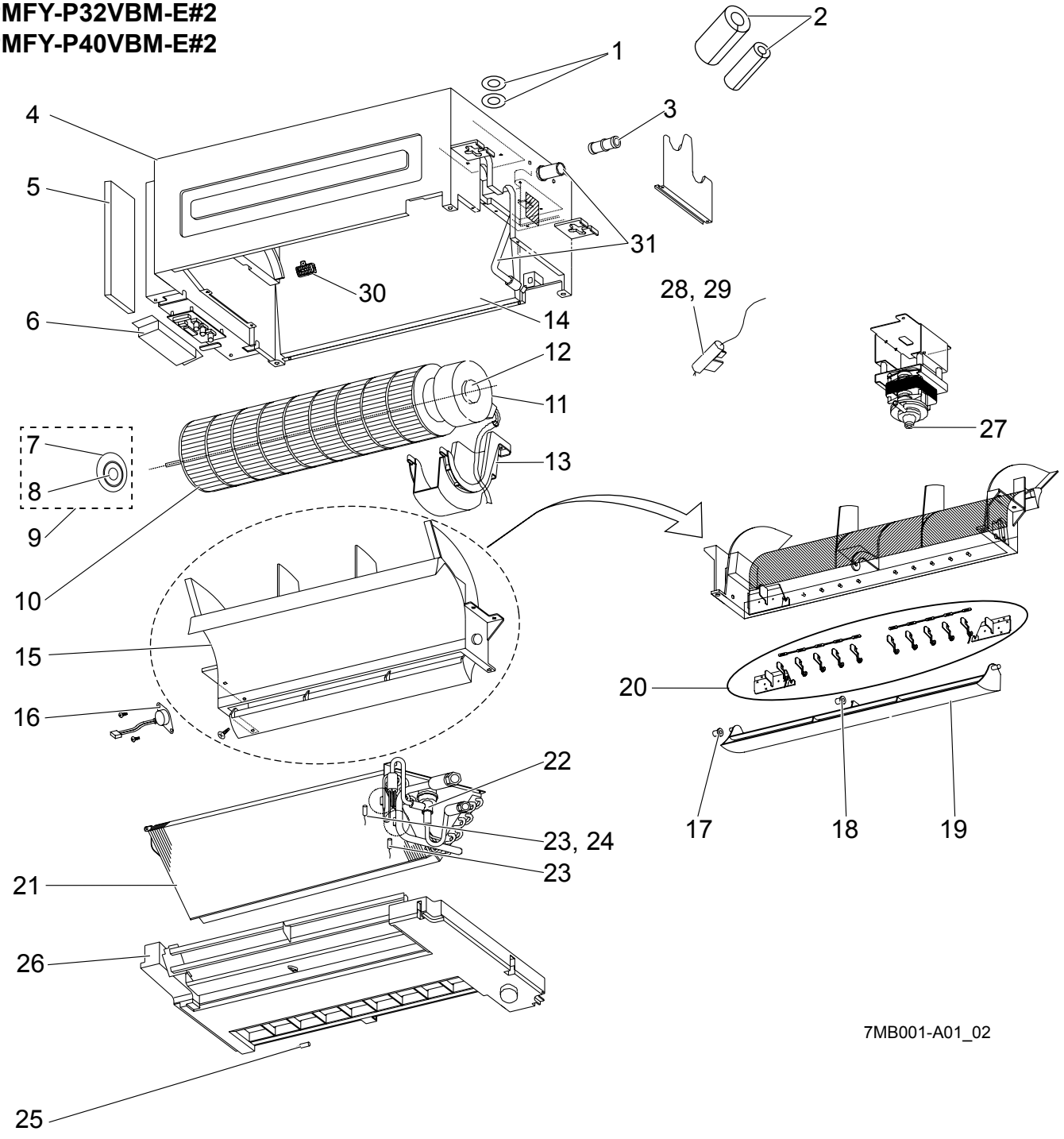
No.	RoHS	Part No.	Part Name	Specif cation	Q'ty/set					Remarks (Drawing No.)	Wiring Diagram Symbol
					PMFY-P20/25/32/40						
					VBM-E	VBM-E$_1$	VBM-E#2	VBM-ER3	VBM-ER4		
1	G	—	CONTROL BOX		1	1	1	1	1	(RG02B337G26)	
2	G	T7W E32 716	TERMINAL BLOCK	3P (L,N,⏚)	1	1	1	1	1		TB2
3	G	T7W E35 716	TERMINAL BLOCK	3P (M1,M2,S)	1	1	1	1	1		TB5
4	G	R01 E44 246	TERMINAL BLOCK	2P (1,2)	1	1	1	1	1		TB15
5	G	T7W E01 294	ADDRESS BOARD		1	1	1	1	1		A.B
6	G	R01 E10 304	CABLE ASSY		1	1	1	1	1		
7	G	R01 E06 239	FUSE	250V 6.3A	1	1	1	1	1		FUSE
8	G	T7W E66 310	INDOOR CONTROLLER BOARD		1	1					I.B
	G	R01 V84 310	INDOOR CONTROLLER BOARD				1	1			I.B
	G	T7W C09 310	INDOOR CONTROLLER BOARD						1		I.B

RoHS PARTS LIST

FUNCTIONAL PARTS

PMFY-P20VBM-E
PMFY-P25VBM-E
PMFY-P32VBM-E
PMFY-P40VBM-E
PMFY-P20VBM-E$_1$
PMFY-P25VBM-E$_1$
PMFY-P32VBM-E$_1$
PMFY-P40VBM-E$_1$
PMFY-P20VBM-E#2
PMFY-P25VBM-E#2
PMFY-P32VBM-E#2
PMFY-P40VBM-E#2

PMFY-P20VBM-ER3
PMFY-P25VBM-ER3
PMFY-P32VBM-ER3
PMFY-P40VBM-ER3
PMFY-P20VBM-ER4
PMFY-P25VBM-ER4
PMFY-P32VBM-ER4
PMFY-P40VBM-ER4



RoHS PARTS LIST

No.	RoHS	Part No.	Part Name	Specif cation	Q'ty/set										Remarks (Drawing No.)	Wiring Diagram Symbol
					PMFY-P											
					VBM-E		VBM-E$_1$		VBM-E#2		VBM-ER3		VBM-ER4			
					20,25	32,40	20,25	32,40	20,25	32,40	20,25	32,40	20,25	32,40		
1	G	R01 E13 097	WASHERS SET										1	1		
2	G	R01 E05 660	PIPE COVERS SET										1	1		
3	G	R01 18J 523	JOINT SOCKET								1	1	1	1		
4	G	—	CABINET		1	1	1	1	1	1	1	1	1	1	(DT00A478GB8)	
5	G	—	CONTROL BOX COVER		1	1	1	1	1	1	1	1	1	1	(RG02B668H01)	
6	G	—	ADDRESS BOARD COVER		1	1	1	1	1	1	1	1	1	1	(RG02L277H02)	
7	G	R01 23A 102	BEARING MOUNT		1	1	1	1	1	1	1	1				
8	G	R01 E04 103	SLEEVE BEARING		1	1	1	1	1	1	1	1				
9	G	T7W E00 103	BEARING										1	1	BEARING& MOUNT SET	
10	G	R01 E32 114	LINE FLOW FAN		1	1	1	1	1	1	1	1	1	1		
11	G	R01 E24 220	FAN MOTOR		1	1										MF
	G	R01 E45 220	FAN MOTOR				1	1								MF
	G	R01 E49 220	FAN MOTOR						1	1	1	1	1	1		MF
12	G	R01 E13 105	MOTOR MOUNT		1	1	1	1	1	1	1	1	1	1	LEFT & RIGHT	
13	G	R01 E35 130	MOTOR SUPPORT		1	1	1	1	1	1	1	1	1	1		
14	G	R01 E05 110	CASING		1	1	1	1	1	1	1	1	1	1		
15	G	R01 E01 079	STABILIZER ASSY		1	1	1	1	1	1	1	1	1	1		
16	G	R01 E18 223	VANE MOTOR		1	1	1	1	1	1	1	1	1	1		MV
17	G	R01 E02 092	VANE SLEEVE		1	1	1	1	1	1	1	1	1	1		
18	G	R01 E03 092	VANE SLEEVE		1	1	1	1	1	1	1	1	1	1		
19	G	R01 E16 002	VANE		1	1	1	1	1	1	1	1	1	1		
20	G	R01 E03 038	GUIDE VANE		1	1	1	1	1	1	1	1	1	1		
21	G	T7W H06 480	HEAT EXCHANGER		1		1									
	G	T7W H07 480	HEAT EXCHANGER			1		1								
	G	T7W H94 480	HEAT EXCHANGER						1		1		1			
	G	T7W H95 480	HEAT EXCHANGER							1		1		1		
22	G	R01 H06 401	LINEAR EXPANSION VALVE		1	1	1	1	1	1	1	1	1	1		LEV
23	G	R01 H16 202	THERMISTOR	LIQUID	1	1	1	1								TH22
	G	R01 N15 202	THERMISTOR	LIQUID/GAS					1	1	1	1	1	1		TH22/23
24	G	R01 H17 202	THERMISTOR	GAS	1	1	1	1								TH23
25	G	R01 H12 202	THERMISTOR	ROOM	1	1	1	1	1	1	1	1	1	1		TH21
26	G	R01 E30 529	DRAIN PAN		1	1	1	1	1	1	1	1	1	1		
27	G	T7W E09 355	DRAIN PUMP		1	1	1	1	1	1	1	1	1	1		DP
28	G	R01 E11 266	DRAIN SENSOR		1	1	1	1	1	1	1	1	1	1		DS
29	G	R01 32K 241	SENSOR HOLDER		1	1	1	1	1	1	1	1	1	1	for DS	
30	G	R01 E02 520	SENSOR COVER										1	1	for TH21	
31	G	R01 E05 527	DRAIN PIPE		1	1	1	1	1	1						
	G	R01 E10 527	DRAIN PIPE								1	1	1	1		

CITY MULTI

MITSUBISHI ELECTRIC CORPORATION

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